

# ANNUAL REPORT 1976



**MARS**  
(Science Fiction, 1940)



**MARS**  
(Science Reality, 1976)

## Our Cover

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### Mars (Science Fiction, 1940)

“Often, as we gaze into the night sky, we wonder if the other planets that circle our sun are populated as is our own world. Are there cities on them? If so, what are they like? Artist Paul here depicts an imaginative, yet scientifically accurate conception of a typical city on Mars.” From ‘Amazing Stories,’ December 1940.

### Mars (Science Reality, 1976)

The first color photo from the planet Mars is one of 3,000 pictures sent back over a Motorola 2-way radio link from the Viking Orbiter 1 from July 20, 1976 through August 30, 1976.

This photo was sent through the Orbiter relay over a distance of approximately 215 million miles. It took about 19 minutes for the signals to travel from the Orbiter to Earth (radio signals travel at the speed of light, 186,300 miles per second).



## Financial Highlights

(Dollars in thousands, except per share data)

	1976	1975
Sales and Other Revenues	\$1,504,431	\$1,311,771
Earnings from Continuing Operations before Income Taxes	159,689	78,470
% to Sales	10.6%	6.0%
Income Taxes	71,822	37,343
Earnings from Continuing Operations	87,867	41,127
% to Sales	5.8%	3.1%
Earnings Per Share from Continuing Operations	3.10	1.46
Research and Development	101,536	98,479
Fixed Asset Expenditures	96,073	70,100
Depreciation	54,631	50,546
Working Capital	419,768	395,493
Current Ratio	2.23	2.60
Return on Average Invested Capital (stockholders' equity plus short- and long-term debt net of short-term investments) (%)	11.6%	5.3%
% of Total Debt (short- and long-term) to Total Debt plus Equity	18.8%	22.1%
Book Value Per Common Share	24.03	21.59
Yearend Employment (approx.)	56,000	47,000



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**Stock Price and Dividend Data**

The table below sets forth the high and low sales price per share for Motorola Common Stock on the New York Stock Exchange and the dividends declared and paid for the periods indicated:

1976	Stock Prices		Dividends	
	High	Low	Declared	Paid
1st quarter	\$51.00	\$41.25	\$.175	\$.175
2nd quarter	59.00	43.50	.175	.175
3rd quarter	58.25	51.00	.175	.175
4th quarter	57.00	47.50	.210	.175
			<u>\$.735</u>	<u>\$.70</u>

1975	Stock Prices		Dividends	
	High	Low	Declared	Paid
1st quarter	\$53.88	\$33.75	\$.175	\$.175
2nd quarter	57.88	44.62	.175	.175
3rd quarter	54.25	40.75	.175	.175
4th quarter	48.50	38.00	.175	.175
			<u>\$.70</u>	<u>\$.70</u>

**Annual Meeting of Stockholders**

The annual meeting will be held on Monday, May 2, 1977. A notice of the meeting, together with a form of proxy and a proxy statement, will be mailed to stockholders on or about March 22, 1977, at which time proxies will be solicited by management.

**Transfer Agents and Registrars**

Harris Trust and Savings Bank  
111 W. Monroe St., Chicago, Ill. 60690

First National City Bank  
111 Wall St., New York, N.Y. 10015

**Auditors**

Peat, Marwick, Mitchell & Co.  
222 S. Riverside Plaza  
Chicago, Ill. 60606

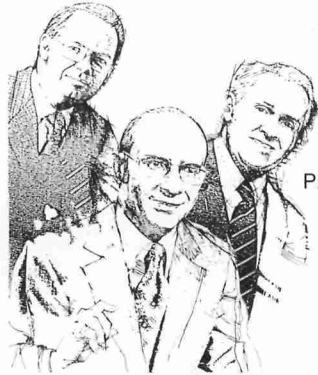
**At the close of each fiscal year, Motorola submits a report on Form 10-K to the Securities and Exchange Commission containing certain additional information concerning its business. A copy of this report may be obtained by addressing your request to the Secretary, Motorola Inc., Corporate Offices, Motorola Center, 1303 E. Algonquin Rd., Schaumburg, Ill. 60196.**

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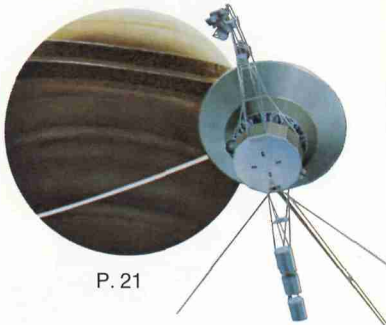
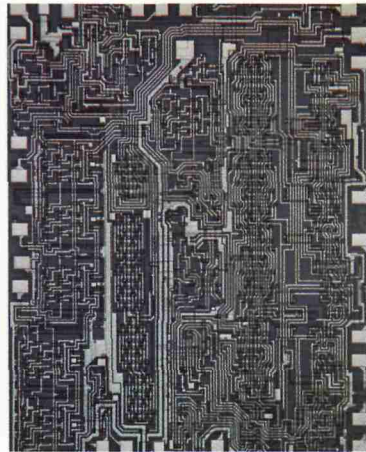
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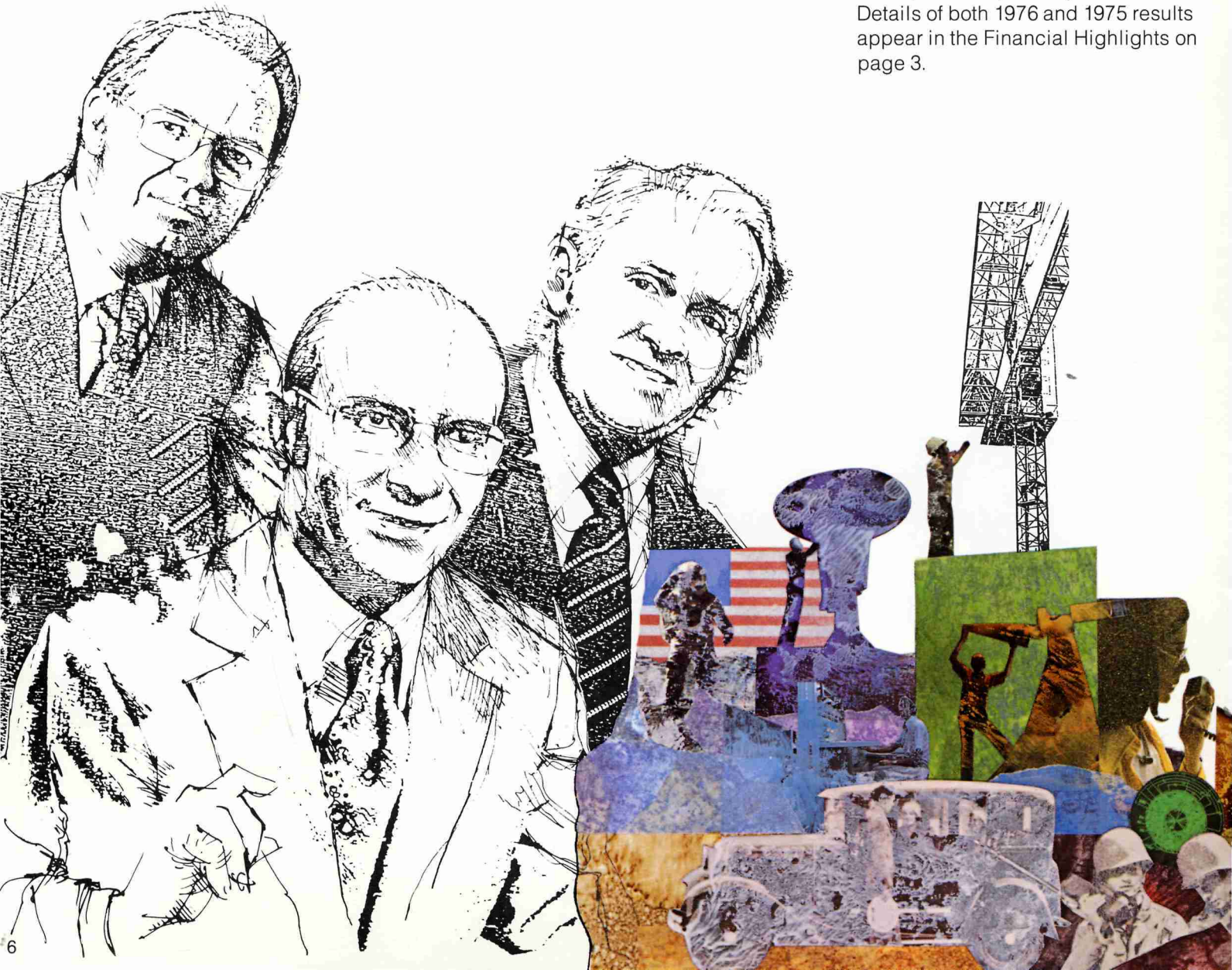
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# 1976: "A Good Year"

## To Our Stockholders and Friends:

1976 was a good year for Motorola. The year marked both an impressive recovery from clearly unsatisfactory 1975 results and many technical, product, market and organizational achievements which are detailed later in this letter and throughout this report. These should have important and favorable impact on Motorola's future.

Sales and other revenue set records in each of the four quarters. For the full year, sales exceeded \$1.5 billion as compared with \$1.3 billion in 1975. Record earnings from continuing businesses were achieved in both the fourth quarter and for the full year. Earnings per share for the year were \$3.10 vs. \$1.46 a year earlier. Details of both 1976 and 1975 results appear in the Financial Highlights on page 3.





We are pleased to report that profit margin in 1976 increased to 5.8 per cent from 1975's depressed 3.1 per cent and return on average invested capital (stockholders' equity plus long and short term debt net of marketable securities) increased to 11.6 per cent from 1975's 5.3 per cent. As we have previously reported, this latter calculation acknowledges the importance of prudent use of assets and is used extensively within the company to assess operating management performance. Our goals for both profit margin and return on capital are higher than 1976's results.

Also, we again call attention to our policy of not stating percentage comparisons between current earnings and those of the year-earlier period—in spite of the fact that such comparisons for Motorola would now be very impressive. We believe that these percentage comparisons often create an impression of far greater than actual earnings and are only meaningful when considered with full understanding of the quality of performance in the previous year. Thus, we emphasize profit margin and return on average invested capital instead.

In January 1977, pricing and other financial issues arising out of the 1974 sale of certain assets of Motorola's home television receiver business to Matsushita Electric Industrial Co., Ltd. of Japan, were finally resolved. Therefore, we are recording, in the year 1976, a non-recurring after-tax loss of \$2.5 million, nine cents per share, which reflects the

difference between the net proceeds from the disposition (including the net proceeds from the disposition of certain assets not sold to Matsushita) less operating losses and expenses incurred in winding up the discontinued business, and including provision for the anticipated cost of defending the lawsuit commenced in September 1974 by Zenith Radio Corporation. The net cash proceeds from the sale and disposition of the assets exceeded \$100 million.

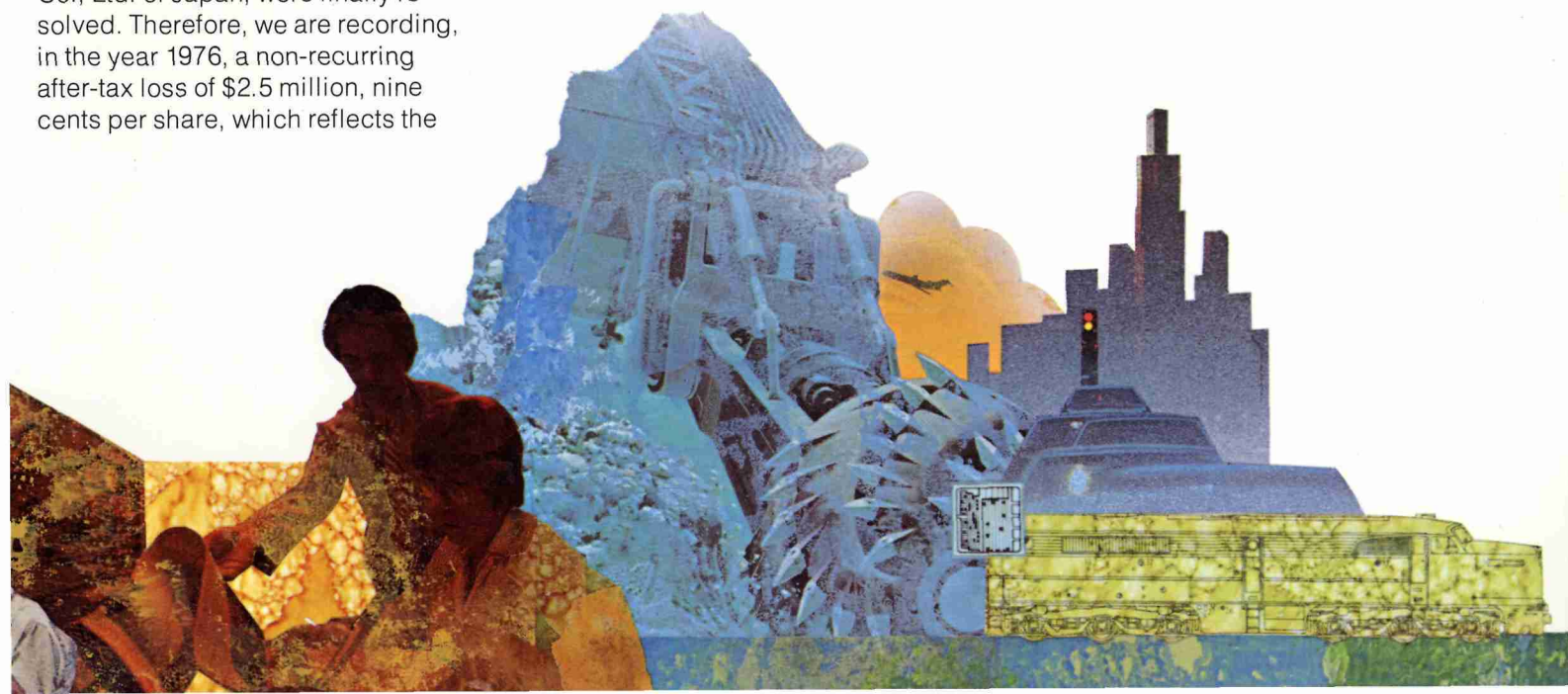
While the **Communications Group** encountered some softening in certain of its non-U.S. markets, the domestic markets generally gained strength through 1976, and enabled the group to achieve record sales and earnings. As detailed elsewhere in this report, many new and competitively attractive products and market applications were introduced during the year.

1976 not only saw the return to solidly profitable operations from its 1975 loss by the **Semiconductor Group** but also the resurgence of its Integrated Circuits business which operated profitably during the final two quarters of the year and which saw many significant positive achievements, particularly in the MOS and micro-processor lines.

The **Automotive Products Division's** sales and profit recovery from 1975 was slowed in the fourth quarter by a strike at the Ford Motor Company, one of its major customers.

The **Government Electronics Division** experienced a changing mix in its business with relatively lower production billings and a higher proportion of research and development programs. The latter category, while somewhat less profitable, does, we believe, bode well for the division's future. The division's earnings and return on asset performance ranks very favorably among its major competitors.

As further detailed in the preceding and following figures and as discussed on page 24 of this report, the company's financial condition remained strong; and total debt, long and short term, domestic and non-U.S., decreased by \$15 million, despite 16 per cent higher sales in the fourth quarter than a year ago.





## Dividend

As reflected in the payment to stockholders on January 11, 1977, the Board of Directors decided, in its December 1976 meeting, to increase the dividend rate by 20 per cent from 17.5 cents to 21 cents per quarter.

## Management

Through the year an evolutionary pattern of organizational change and management staffing continued. Particular emphasis was placed on increasing the depth of leadership of the divisions established within the Communications and Semiconductor Groups in late 1975.

Alfred J. Stein joined Motorola as vice president and general manager of the Integrated Circuits Division, a position which Robert R. Heikes, assistant general manager of the Semiconductor Group, had been temporarily filling since creation of the IC division.

John D. Mueller also joined Motorola as vice president and director of marketing in the Automotive Products Division.

Within the Communications Group, Joseph F. Miller, Jr., vice president and general manager of the group, was elected a senior vice president. Ira W. Walker and John M. Duich were elected vice presidents and named assistant general managers of the Communications Distribution Division and the Communications Products Division, respectively. In January 1977 the group's former systems operations was designated a division of the corporation. Vice president Martin Cooper, and Eugene L. Simpson, who have led this activity for several years, were named general manager and assistant general manager, respectively, of the new division.

As an additional means of strengthening upper management and providing appropriate recognition, a new class of appointed vice presidents was created and eight senior division, group and corporate staff executives were initially named to this officership.

## Board of Directors

At the May 1976 stockholders' meeting, B. Kenneth West, senior vice president of the Harris Trust & Savings Bank, was elected a director.

In another important Board matter, we note with great appreciation for his Motorola service that, Elmer H. Wavering will not be standing for reelection to the Board at the forthcoming stockholders' meeting. Mr. Wavering's total Motorola service, including the past four years as a director only, spans more than 46 years. Recognizing the extreme value of his many contributions to the corporation over this almost half century, the Board intends at its first meeting after the stockholders' meeting to name Mr. Wavering director emeritus.

## The Future

At this point, early in 1977, prospects are improving for growth in the U.S. economy through the year. The international outlook is less clear, and it varies from nation to nation. We are continuing to carefully monitor and thoughtfully consider all the signs, especially our own orders and bookings. We currently expect that the year will provide each of our major operations the opportunity for increased sales and profit.

Looking beyond 1977, the foundation of our increasingly well-defined corporate strategy is Motorola's unique position in the electronics industry. We are one of a very few equipment manufacturers with both excellent semiconductor technology, the core of the electronic art, and a strong base in advanced government electronics where many frontier applications can be first afforded. We believe that the distinctive competence provided by this combination of strengths, as well as our leadership positions in the markets we currently serve, will continue to provide us opportunities for growth not only in our existing activities but in related fields.

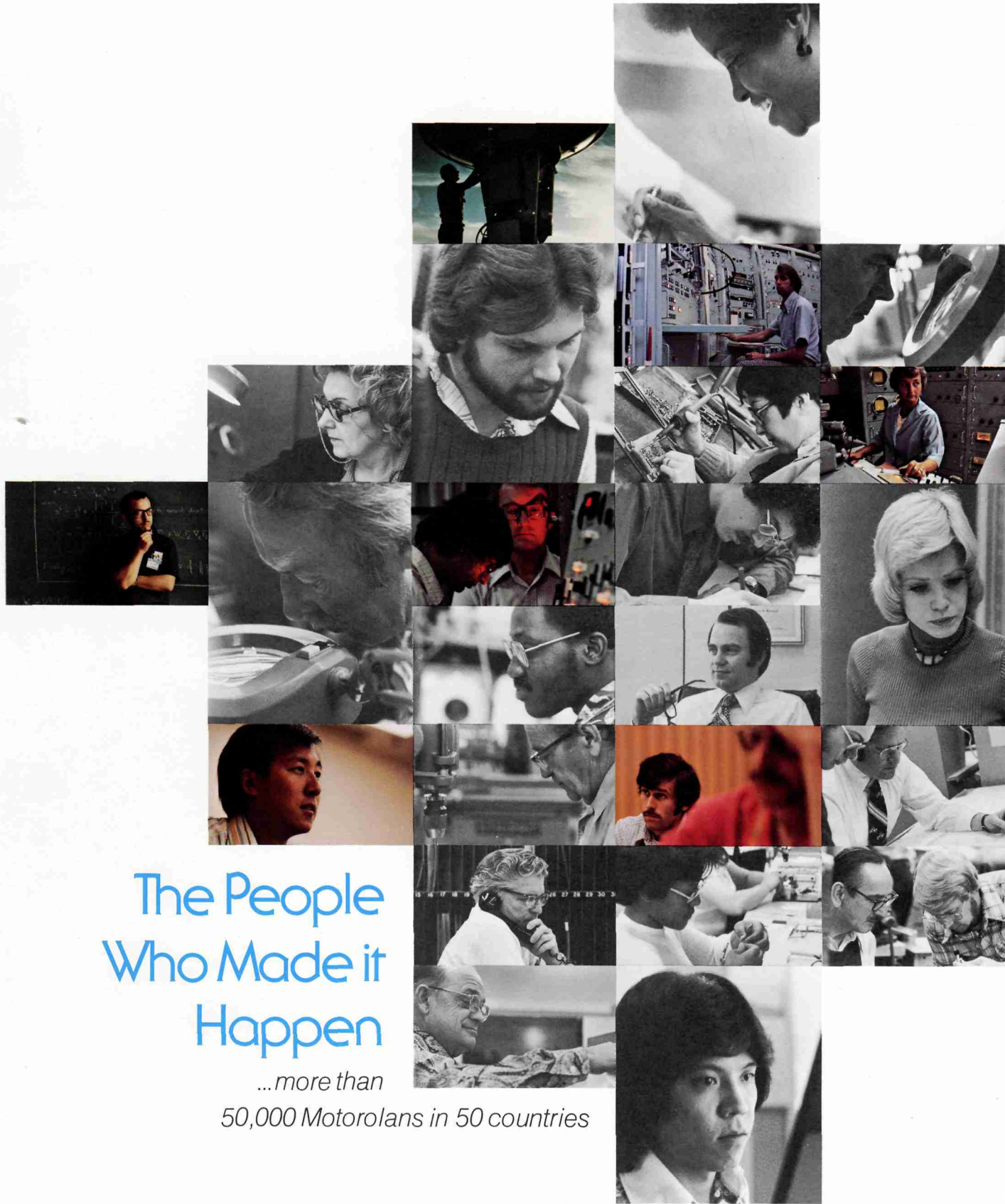
In closing, we thank all Motorolans for their splendid dedication, without which neither the achievements of 1976 nor the potential of the future could be realized.

**Robert W. Galvin**  
**Chairman**

**William J. Weisz**  
**President**

**John F. Mitchell**  
**Executive Vice President**





# The People Who Made it Happen

*...more than  
50,000 Motorolans in 50 countries*







## In the beginning there was the shout...

*Today increasingly sophisticated custom communications systems are keeping everybody in touch with everybody else!*

People have always reached for closer communication with other people. Yet, while human beings dreamed of flight centuries before the Wright brothers, no citizen of the Middle Ages ever dreamed of the telegraph or the telephone—much less a mobile radio, a personal paging system or an emergency medical data link between paramedics and hospitals.

The entire science of electronics wasn't even conceived until the last half of the nineteenth century. Mysteriously glowing scientific curiosities called Crookes tubes demonstrated what electricity was made of and opened the door to instantaneous voice and visual communication.

But the basic need to communicate exists across the total spectrum of business, industry, public safety, government and the general public. Motorola technology is continuously growing in our efforts to serve a continuously growing and remarkably segmented market. We are nowhere near saturation.

The Communications Group achieved its twenty-fifth consecutive year of sales growth in 1976. The demands of the market, the continuing recovery of the economy and strategic investment spending were directly responsible for yet another successful year.

**This record strong performance by the Communications Group in 1976 resulted in net sales up 14 per cent, worldwide new orders booked up 11 per cent and profit margin about level with the fine results achieved last year.**

**Domestically, an important development in the year was that all major U.S. customer markets were growing by the third quarter, and continued their positive growth through the fourth quarter. Thus, 1977 began with a domestic marketplace that has returned to a healthy and constructive environment.**

**Internationally, the Canadian, European and Australian markets showed the most strength. New order input in Canada and Australia was well ahead of last year.**

**Year-to-year comparisons of European orders, however, are down from 1975. This is attributed to two unusually large orders which came in just before the end of '75 and tend to put a healthy 1976 growth curve in less than accurate perspective. The gains in these parts of the world were offset by weakness in Mexico, South Africa and some of the lesser developed parts of the world.**

**All in all, the net orders in the international market were about level with 1975.**

The group's great strength continues to lie in its ability to identify and then satisfy the widely diversified needs of its widely different kinds of customers.

Through the years there has developed a sophisticated internal organization to analyze customer needs and design products that specifically meet them. From the communications aspect, the group gets to know a customer's business better than the customer does himself. Then a determination is made as to which of the group's current products present the best solution—and what products should be created in anticipation of emerging

needs. Product offerings are continuously being reevaluated and updated.

To meet the demands of increased growth, a massive search for more bright young engineers was launched. Divisional vice presidents personally visited universities and colleges across the country to recruit the new talent needed to assure the future technological leadership and continued growth in a highly competitive and changing marketplace. Several hundred people were hired—the largest, single addition of new engineering talent in the group's history.

Society itself was largely responsible for the growth pattern during 1976. Radio communication was increasingly recognized as a factor in solving many major national problems such as energy conservation, environment, pollution and health care.

New developments trend toward communications systems that do more. The Los Angeles Police Department "Rover" system uses Motorola MX-300 portable radios that also include an identification function and emergency alarm. These features were formerly found only in vehicular radios.

To meet favorable customer reaction to communications systems with increased capabilities, the group responded with a new Multi-Line Data Terminal and Digital Voice Privacy System. The data terminal gives a police officer the capability to relay printed messages to the dispatcher or directly to the computer from the vehicle. The entire message can be displayed on the terminal's screen. The Digital Voice Privacy System

**Linking patients with hospitals speeds life-saving emergency medical care.**





uses voice scrambling techniques which make it virtually impossible for an unauthorized listener to intercept messages.

The health care field is alive and well and growing at a healthy rate. Health care agencies are turning to sophisticated communications systems to improve medical services. It has been less than twenty years since the HEAR radio system first helped hospitals communicate with each other in emergencies.

Today Motorola systems will transmit a patient's EKG and simultaneously provide telephone-type



**Motorola communications networks help police officers do their jobs.**

communication between hospital physicians and Emergency Medical Technicians at the scene of the emergency.

The utilities and other energy producing companies are a rapidly growing market because of radio's ability to improve energy conservation. 1976 saw Motorola equipment play an increasingly important role.

New load management systems help utilities lower peak levels and reduce the cost of wholesale electric power. Here's one example of how they work for the Buckeye Power Corporation in Columbus, Ohio. Sophisticated Motorola radio switches are attached to water heaters throughout the city. A computer samples the utility's load every five minutes. When the load reaches a predetermined level, the computer signals radio switches to shut off the heaters for a few minutes. The number of water heaters shut off is in direct proportion to the peak level—and the shut-off time is so brief that no one is ever aware of it.

These systems save peak generating capacity and increase fuel efficiency so that electric companies find that they can actually receive a complete payback of investment within two or three years.

In another energy-related application, the new Alaska Pipeline was augmented by an extensive Motorola communications system.

The available radio frequency spectrum will be three times greater as the 900 MHz band becomes available after a long series of negotiations.

At the end of the year, the Federal Communications Commission (FCC) reached an agreement with Canada and Mexico which will allow the operation of 900 MHz systems in most major U.S. cities including Los Angeles, New York, Chicago and Philadelphia. Motorola has already shipped a number of systems to several different markets.

The group developed the first FCC type-accepted mobile radio in the band which promises to alleviate congested frequencies. The true impact of this important 900 MHz opportunity will not be felt for a few years, and Motorola is in an excellent posi-

**Applied technology creates families of products, MX-300 portable radio (right) and MBX-1000.**



**(right) Two-way radio communications are proving a valuable tool for key industries such as construction.**

**(far right) From roof tops to mountain tops, Motorola communications systems are designed to fit customers' needs.**

tion for future development.

Internationally, years of investment began to pay off in 1976.

The group now offers multiple tiers of mobile, portable and paging products which have opened up new markets.

Some of the products which made the most important contribution this year were the MX-300 series portable radio, the MAXAR mobile radio and the MICOM single side band unit.

The group also introduced the MBX-1000—one of the smallest, high performance mobile radios in the world with true system capability.

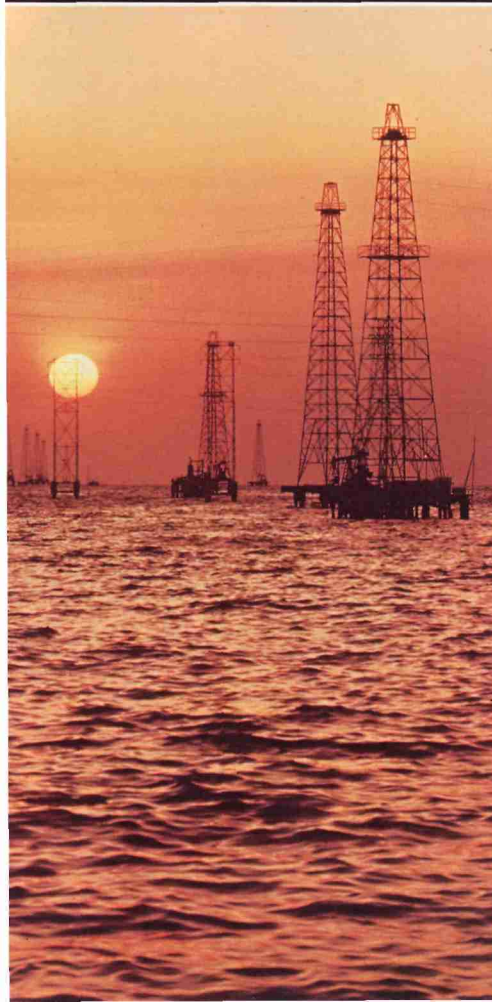
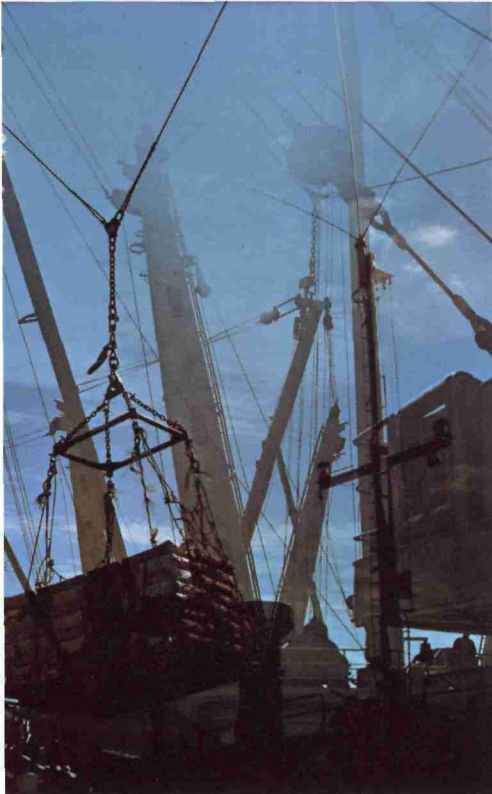
In 1976, a broadened product offering and maturing European organization began to establish Motorola as an important supplier in that part of the world. This has been an important long-range goal.

Expanded product lines and years of market development in Europe led to growth in the public safety, transit and industrial sectors. By the end of the year the group had public safety customers in major European capitals including London, Rome, Paris, Berlin and Amsterdam.

Paging equipment continued to be the primary product in Europe. In the Netherlands, Motorola installed the paging terminal for the largest paging system order it has ever received. A nationwide paging system will soon cover Austria. Market segments ranging from fire brigades to business are using pagers in Sweden, West Germany and the United Kingdom.

One of the year's more unique challenges was a hail control system to protect the Yugoslavian grape crop. The group worked with the Hydro-meteorological Institute to engineer a weather information relay system using Motorola radios and repeaters. The information gathered by this portable system allows rain clouds to be ionized in time to prevent hail from forming.





Business in Canada began slowly in 1976 but gained momentum so that the year ended on a strong note.

Particularly active customers were small system users and regional users such as the petroleum operations in Alberta.

New technological skills were important to the group's success in 1976.

One was the development of the PULSAR II radio-telephone. It uses advanced semiconductor technology to remember telephone numbers and to automate many telephone functions. It was basically designed to allow drivers to concentrate on driving, but the same technology can be applied to home telephones in the future.

Motorola is also the most important processor of quartz in the world. Quartz is not only used as the frequency determining element in most radios but is also used in computer timing circuits and now in quartz watches. The industry sold fifteen million quartz watches in 1976 alone. Almost half of these watches have quartz crystals manufactured by Motorola.

The Communications Group has built its business by having excellent product technology and excellent customer service.

And, the technology and products of the group have taken their place in the fabric of society as people communicate more, as sophisticated health and life saving techniques are needed, and as conservation and public safety become more critical considerations for society.

For more than a quarter of a century business has improved each year as technology grew, products and systems were expanded and customer service refined. Now Motorola produces more than 4,000 different models of two-way radios and has moved into other electronic related fields.

None of this happened by accident. The group has run hard to be the best.

And they're still running.

**(above left) Multiple tiers of products provide opportunities in major international communications marketplaces.**

**(left) In an energy-starved world, communications are important in the finding and conserving of energy sources.**



**Joseph F. Miller, Jr.,**  
Senior Vice President  
and General Manager  
Communications Group



**Jack Germain,**  
Vice President and  
Assistant General  
Manager  
Communications Group



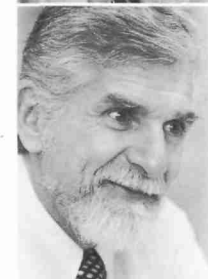
**Claude G. Davis,**  
Vice President and  
General Manager  
Communications  
Products Division



**Arthur P. Sundry,**  
Vice President and  
General Manager  
Communications  
Distribution Division



**Rhessa S. Farmer, Jr.,**  
Vice President and  
General Manager  
Communications  
International Division



**Martin Cooper,**  
Vice President  
and General Manager  
Communications  
Systems Division



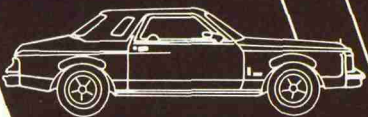
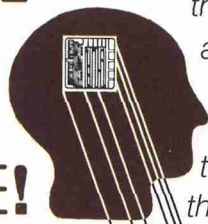
# THE MICROPROCESSOR ...A BRAIN IN MINIATURE!

*One semiconductor, less than a quarter of an inch square, can make one million decisions in less time than it takes to read this sentence!*

There is a device which contains a hundred billion individual components, each so small that the whole thing weighs no more than three pounds and is not more than about one hundred cubic inches in volume. We call it the human brain.

There is another device that is four ten-thousandths of one cubic inch. It can make more than one million electronic decisions every second—and it's possible for one chip to account for 310 *trillion* separate functions. We call it a semiconductor.

The semiconductor, in one of its newest forms—the microprocessor—is actually the heart of a powerful





microcomputer. The microprocessor is made by a very interesting photolithographic process.

Microscopic patterns are projected onto a thin slice of sensitized silicon which is then developed and etched. This etching exposes selected parts of the silicon to chemical elements that change the chemical nature of these areas. The process is repeated several times using different patterns and chemical elements to form electrical paths which can be turned on and off electronically. This resulting tiny chip full of sophisticated circuitry is quite literally the basic building block for future electronic technology.

In the near future it is probable that computers will take over control of automatic transmissions and fuel injection systems in cars. Computers will be able to run homes of the future monitoring fire and burglar alarm systems—automatically controlling houselights and locks on doors and windows—they'll even be able to water the lawn. Microcomputers in the home could automate shopping and make financial transactions without writing checks. There is a possibility that programs from the wealth of television, stage and motion picture entertainment will be available whenever the viewer wishes.

This microprocessor has the potential to revolutionize the way we live, the way things operate—but actually it has been evolving for many years in the semiconductor industry. Since the

invention of the first solid state device approximately 30 years ago, the industry has been developing new and better ways of designing more and more functions into a single device.

Almost since the semiconductor industry's inception, Motorola has been a major participant.

**1976 was a recovery year, for both the semiconductor industry and for Motorola's Semiconductor Group. Following what was one of the worst years in the history of the semiconductor industry, Motorola's 1976 performance reflected substantial improvement in sales and new orders plus a return to profitability.**

**As a result of the steadily increasing demand in most U.S. and non-U.S. markets, sales have increased in each quarter, compared to year-earlier quarters. For the full year, sales of the Semiconductor Group were up 28 per cent over 1975.**

**The improved sales performance took place in all three major world markets (U.S., Europe, Asia) as well as in the major product categories, discrete devices and integrated circuits.**

**The rebound in bookings has been more dramatic than in sales. The group's worldwide new orders booked were up about 65 per cent over last year.**

**The most important accomplishment of the Semiconductor Group this year has been its return to profitability. The profit turnaround that began in the fourth quarter of 1975 continued into 1976. As a result, the group operated at an acceptable profit margin for the full year.**

**Both discretely and integrated circuits contributed to the earnings performance. Integrated circuits, while operating at a loss for the full year 1976, operated profitably in the third and fourth quarters. Discrete products operated at satisfactory profit levels throughout the year.**

Success in the Discrete Semiconductor Division is primarily the result of increased productivity, improved yields and strategic capital investment programs which have led to a more aggressive marketing stance.

The year provided a sound foundation for future growth and solidified Motorola's leadership in the discrete component industry.

Key programs were initiated in 1976 which have impacted productivity. The improved productivity has been essential to countering steadily rising costs.

One of these programs was aimed at establishing stricter manufacturing disciplines and improved working environments. It helped increase productivity in some parts of the operation by more than 17 per cent over 1975.

There was also considerable success in improving processing yields. One example: The division improved silicon power wafer processing by using a glassivation process on silicon power transistors. This process protects open junctions on the transistor with a thin layer of glass. This technique has resulted in about a seven per cent higher wafer processing yield and as much as a 15 per cent improvement in final test results. Comparable improvements have been made in other discrete product families.

These improved efficiencies have supported more aggressive pricing. Prices were reduced by as much as 40 per cent on several product lines including some small signal transistors, zener diodes, axial lead rectifiers and thyristors. One of the unique challenges and opportunities of the semiconductor industry is the historic trend of declining of prices as opposed to increasing prices experienced by many other sectors of the economy. This has been a major factor in expanding the total semiconductor market.

Programs to increase yields and reduce costs require increased investment. Adequate and consistent fixed asset spending is key to the achievement of future goals.

As part of a multi-year investment program, the Discrete Semiconductor Division is automating process and product equipment in important areas such as power and signal transistors. The use of computer-operated diffu-



sion modules is growing along with increased use of ion implantation. These investments are strategic. They not only should lead to increased share of market, but should also help provide better overall return on investment.

During 1976, Motorola continued to earn its front running reputation for developing and introducing new discrete products for both existing and new applications. A few examples:

A new 1500 volt horizontal deflection transistor was introduced into the television market. This unit "deflects" an electronic beam in a TV picture tube after the beam leaves the electron gun. It has already been accepted by U.S. television makers and should soon be approved by other domestic and European customers.

More introductions of new, state-of-the-art devices are planned for the TV deflection market within the next year.

Also introduced was an expanded line of switch-mode power transistors which offer both size reduction and efficiency improvement to customers in the computer, industrial and military markets.

New higher reliability thyristor products are being offered to the industrial market at lower prices. They're being made by a new patented photo-glass process.

AM tuning diodes are now being offered to the automotive industry. These devices will permit car radios to be removed from the space-tight dashboard and placed under the seat or in the trunk. They represent an opportunity for important sales growth in small signal products.

1976 was a year for pulling it together in the Integrated Circuits Division. New management stepped into key posts, and employees put shoulder to the wheel with programs that boosted productivity. The MOS operation tightened up and yields improved considerably. While the opportunities and underlying strategies for the IC Division are somewhat different than they are for the Discrete Division, the goal is the same: to

improve market share, profitability and technological leadership.

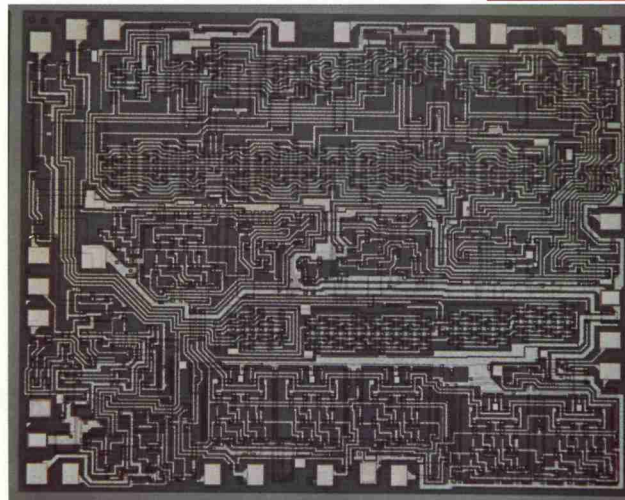
The division continues to enjoy a front rank position in the linear IC marketplace. It is quite strong in all important linear processes including ion implantation and linear compatible I<sup>2</sup>L. The division manufactures a broad line of linear products and has an aggressive new product development program.

The new frequency synthesizer, which has application in recently introduced 40 channel citizen band radios, and new telephone encoder/decoder circuits are examples of major future sales opportunities.

Significant progress was also made with a variety of digital products during 1976.

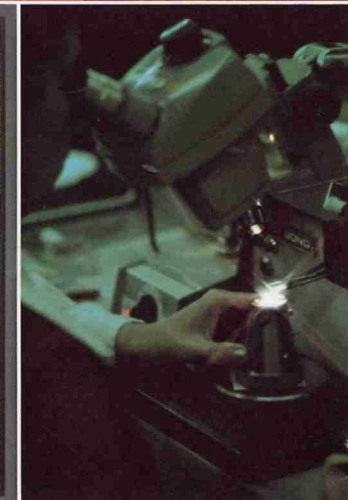
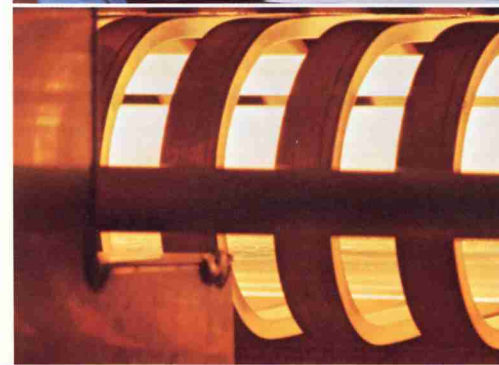
A new high speed 4-bit micro-processor line was introduced at mid-year and is already a major factor in the high speed market. For good reason. It is the fastest operating bipolar processor on the market and is expected to greatly improve the division's

**Today's new generation of micro-circuits can include many thousands of active components integrated into a tiny sliver of silicon.**



opportunities in the Central Processor Unit (CPU) segment of the computer market.

During the year, the division acquired a license to manufacture the 2900 Schottky 4-bit slice microprocessor. This addition to the line is aimed at the medium speed CPU and controller segments of the computer market.



Dramatic growth is expected from both markets over the next few years.

In another transaction, an alternate source agreement was signed which gives the IC Division the right to produce a line of more than 100 low power Schottky devices. Production started early in 1977. Plans are also underway to develop a proprietary line of



Schottky devices. This combination should give Motorola a strong position in this market where there was not a previous Motorola entry.

In 1976 very important progress was made with MOS integrated circuits which are critical to long-term success in the IC industry.

In Europe Motorola is now the leading CMOS supplier and intends to be number one in the U.S. soon. Motorola continues to offer the broadest line of standard CMOS parts in the industry and is improving its position in the important custom CMOS marketplace.

The shipping rate of NMOS memory

**(left) Computer controlled diffusion furnaces are used in processing silicon wafers.**

products continued to improve during the year. New product development was extremely active resulting in several key products being scheduled for introduction in early 1977. These new products include: advanced 4 thousand (K) bit and 16K bit dynamic random access memories (RAM), a 4K static RAM, an 8K erasable programmable read only memory (ROM) and a 16K ROM.

The semiconductor memory market, where these devices are sold, is one of the most rapidly growing segments of the industry. Applications include use in microcomputer systems in a wide

**(below) Microprocessor "clean room" production area minimizes contamination and thereby improves yield.**

The Semiconductor Group operates in a pioneering industry where technology is exciting and new product applications are discovered every day. The group moved in stride with the industry this year, and moved ahead noticeably in several product categories.

New products and consistent improvement in productivity and yields are critical to success in the semiconductor industry, and the group concentrated efforts in these areas. A consistent capital investment spending program helped.

The Semiconductor Group is growing profitably. That's both a reality and a commitment.



**(left) RF Modules are so small and delicate workers must use microscopes during assembly and inspection process.**

variety of control functions ranging from refineries to bakeries; and main-frame computer memories where they offer high speed, high density memory capacity at low cost.

Motorola's M6800 microprocessor family has scored well in the highly competitive microprocessor marketplace. 1976 resulted in the division being awarded several major design and developmental contracts for this important product. It now holds a strong second position in the market. The 6800 product line is being alternate sourced by several other major semiconductor manufacturers.

The division has other key programs aimed at sustaining its growth in the microprocessor market, including the planned introduction of both simpler as well as more complex versions for a variety of consumer, industrial and commercial applications.

**John R. Welty,**  
Vice President and  
General Manager  
Semiconductor Group

**Robert R. Heikes,**  
Vice President and  
Assistant General Manager  
Semiconductor Group



**Gary L. Tooker,**  
Vice President and  
General Manager  
Discrete Semiconductor  
Division

**Alfred J. Stein,**  
Vice President and  
General Manager  
Integrated Circuits Division



The world's first automobile was built in 1769. It was a steam carriage and there was only *one*. Automobile sales weren't quite that bad in 1975, but they felt like it.

1976 was something else. Automotive Products Division sales hit an all time record, and the division returned to profitability.

**Full year sales were up 23 per cent from 1975. This resulted primarily from a much improved automotive industry where Motorola has major OEM (original equipment manufacturer) sales. In addition the division reported large sales increases of both alternators and Motorola branded automotive entertainment products.**

**Major operational improvements were achieved domestically and this was one of the principal factors in the return to profitability. However, the division's total year profit was adversely affected by the Ford strike in the last half of the year and a con-**

**tinued funding effort to establish a foothold in Europe.**

In 1976, Motorola entered the citizen band radio business with four underdash models, a base station adapter, a full line of antennas and a wide range of accessories.

Shipments began in June, and orders for CB radios poured in faster than they could be made. At the end of July, the FCC announced a decision to relieve the congested CB traffic jam by expanding the number of channels from 23 to 40.

The hook. The new 40 channel radios could not be sold until January 1, 1977. There was massive confusion at the dealer and consumer level. Industry sales eroded. Fortunately, the division did not have much 23 channel inventory. CB sales are expected to recover during the first quarter of 1977 with 40 channel product available. The division expects CB to make an important contribution to its 1977 profits.

In addition to Motorola branded aftermarket CB sales, an original equipment contract was received from Ford for underdash CB units as options on the 1977 Lincoln and Mark V models.

A contract was also awarded to supply CB radios with remote transceivers for selected models of 1978 Ford cars.

Important orders were received for new electronic engine control products. These devices which are designed to increase engine operating efficiency will appear on 1978 cars and should represent a major business soon thereafter.

The division is continually reworking existing products to reduce costs and improve performance. One example is an updated integrated circuit version of an AM radio introduced in the fourth quarter. The new design will improve product and component standardization, utilize more efficient manufacturing techniques and provide even better operating performance.

**1976: AUTOMOBILE  
SALES GET UP  
TO SPEED  
AND AUTOMOTIVE  
ELECTRONICS TAKE OFF**



**Automotive entertainment products bring today's sounds to the automobile.**



40 channel CBs are expected to be an important factor in the division's 1977 results.

The fact that 1976 was a good year for automobile sales was not the only reason for Motorola's better performance. The Automotive Products Division is growing rapidly, and has won a number of pitched battles against competitors who are extremely good at their work.

This growth situation is the result of an effort to constantly improve the quality of work.



Motorola is a leading producer of "under the hood" electronic products and instrumentation.



Quality is more important today than ever before and raising product quality to an even higher level of consumer satisfaction has become an important strategic thrust of the division. The quality control organization has been given more authority, more range, more manpower and more control.

Appropriate steps are being taken to add new accounts and to generate new products for our existing customers. The current customer list includes Ford, American Motors, Chrysler, Volkswagen, Renault, Citroen and British Leyland. And the division is ready for more.

The marketing function has been restructured to provide broader services and to put more concentration on two important customer groups, OEM and aftermarket.

charging systems, electronic ignition systems, engine management systems and other instrumentation. The division is now reaching out to do more.

And the time is right. The electronic age of the automobile is just beginning to develop, and because of its automotive know-how, Motorola should have a leading role in this exciting era.



The division's product organization was also reorganized to more closely link the engineering and manufacturing functions for better product control.

To solidify its good position with present customers, Motorola works with them on long-range development programs. The division is assuming the role of a high-technology consultant with a view towards participating in the business on a long-term basis.

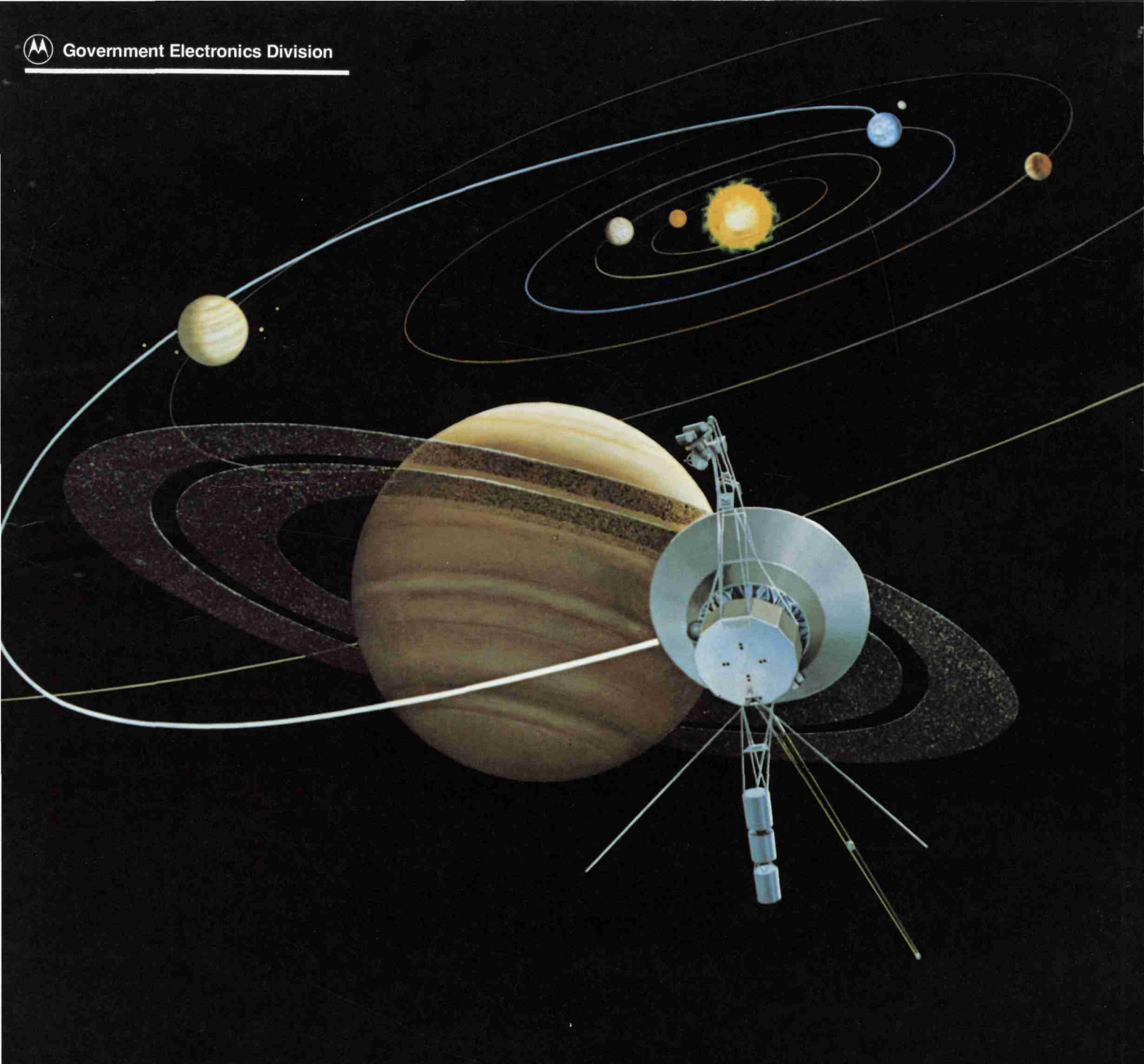
There are also plans to develop relationships with other non-electronic automotive suppliers. Joint development programs with established automotive suppliers should enable Motorola to offer its customers even more products than it produces now—and that's a fundamental goal.

The car has already been turned into a mobile entertainment and communications center. Electronics have already gone under the hood with alternator

**Carl E. Lindholm**, Senior Vice President and General Manager, Automotive Products Division







## Our Space Odyssey

It has been more than 2,200 years since Aristotle said:

*"Since all matter is contained in one world, there can be no others."*

Aristotle, wise man that he was, was dead wrong on this one.



In 1976, Motorola technology went to Mars twice with the Viking I and the Viking II missions. And some will say the shout heard round the world on July 20, 1976, the day the U.S. landed on Mars, emanated from Motorola's Government Electronics Division plant in Scottsdale, Arizona.

The Viking spacecraft were designed for 120 day-orbital missions—but the flow of information being received has lasted a great deal longer than that. Earth is still receiving information from Apollo instrument sites on the Moon. The Motorola instrumentation left on the Moon during the Apollo 16 mission was designed to deliver 365 days of operation. It has already delivered almost five times the service called for by the goals of the mission, and at last report it was still going strong.

The space odyssey is one example of advanced research turned into reality, but the Government Electronics Division is constantly probing the unknown. The result is a strong leadership position in frontier technology.

It's true that research and development programs are less profitable than large scale production, but they provide the base for leadership in advanced electronics which is required for future more probable production programs.

**Total 1976 shipments by the division were down about 3 per cent from 1975's record level and, due to R & D contracts being a greater share of total business, profit margins were down slightly from last year. New order bookings, while improving in the latter part of the year, were less than in 1975.**

In the U.S. in 1976, there were several large customer contracts awarded which will advance the division's technology base.

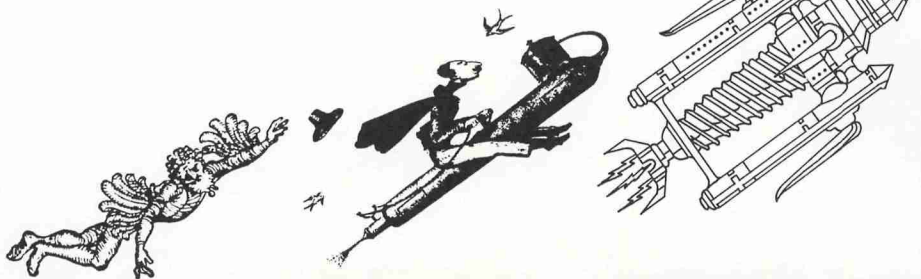
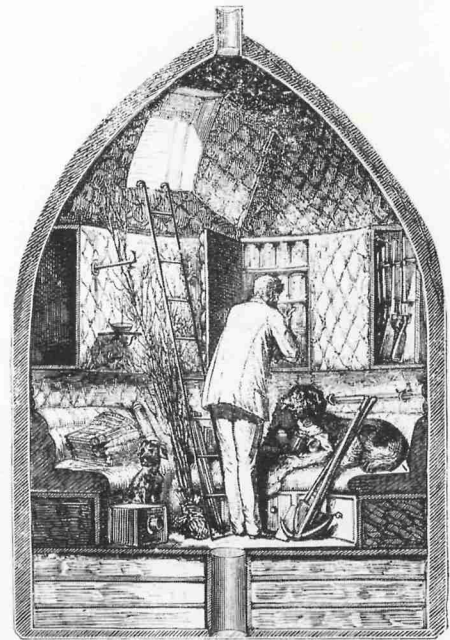
For the Air Force, engineers are designing an advanced electronic scoring system for use with supersonic target drones. An electronic radar sensor system mounted in the pilotless drone target detects attacking missiles and sends signals to a ground station that prints out an electronic score card to tell exactly what happened at 50,000 feet at supersonic speeds.

The ALQ-122 countermeasures system for the Strategic Air Command's B-52 aircraft neutralizes enemy early warning and acquisition type radars by creating electronic confusion. The system detects incoming enemy radar signals and automatically denies use-

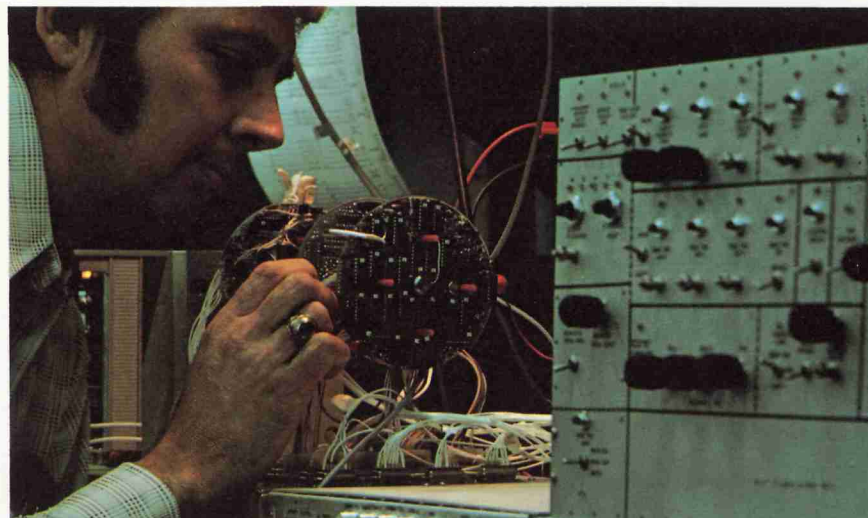
ful tracking information. Another associated Air Force contract was awarded in 1976 for flight line test equipment to be used with the ALQ-122 system.

The division received an order from NASA as a part of their standardization program to develop transponders for use as part of the data control and communications links in the Advanced Tracking & Data Relay Satellite System. This system will be the base of U.S. near-Earth space communications in the 1980s. Two satellites, on either side of the earth, in a constant geosynchronous orbit, will be able to track and receive data from spacecraft—and relay the resulting information back to Earth.

Another program, this one from the Navy, works something like a tele-



The quest for space has taken many forms, from imaginary spaceships to detailed and "scientifically" drawn men from Mars.



(right) Electronic sub-assemblies for missile guidance systems are field and bench tested.



phone switchboard in the sky that will put more people in touch with more people with automatic priorities on a need-to-use basis.

Several important projects, including target detection systems for the Navy, the development of an advanced radar seeker system for Department of Defense missiles and the delivery of transponders for a space-based navigation system to provide extremely accurate positioning information almost anywhere on the globe also got underway in 1976.

The division significantly increased its business abroad in 1976. Europe continued to be the focal point of the

**Unique testing range for radar target scoring system utilizes a stationary drone target and 400 feet-per-second fly-by-wire simulated missiles.**

international marketing effort.

The Italian Navy and the Norwegian Air Force were both customers in 1976. The Italian Navy contracted for new helicopter radar tracking equipment, and delivery started on multi-channel ground-to-air communications equipment to the Norwegian Air Force.

A new direction finding system was introduced that features a compact, all electronic antenna that one person can make operational within minutes. The first sale was to a Canadian systems company for air traffic control. New products also included a unique Data Processor designed to work with the Motorola Mini-Ranger Position Determining System. It quickly found outstanding worldwide acceptance.

The Government Electronics Division makes its mark in the fast-track world of advanced technology partly because its business strategy emphasizes advancing the state of the electronics art. One-third of the division's work force are skilled engineers who specialize in the division's major segments: Communications, Radar and Tactical Electronics Operations.

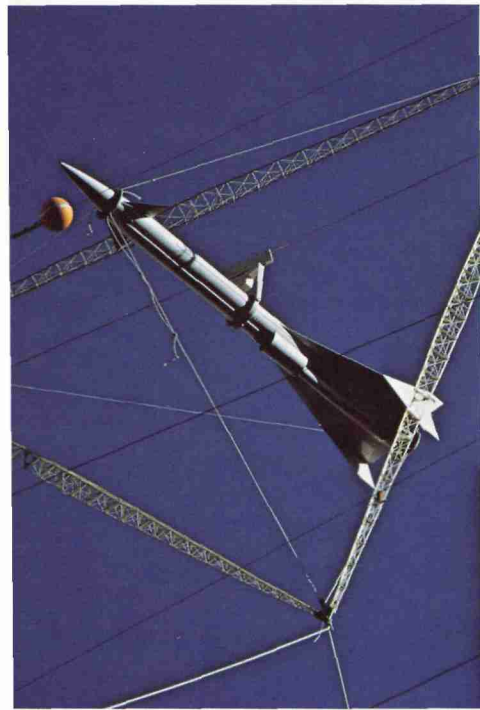
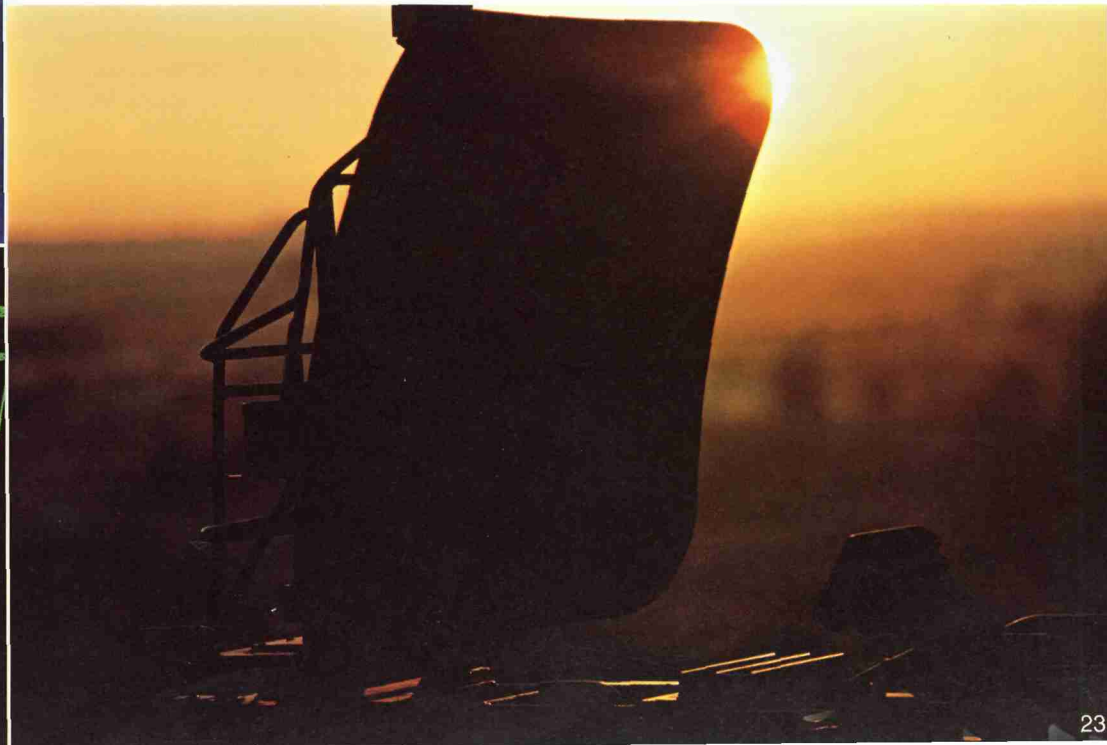
Much of Motorola's technology and the technology of the world in 1976 was beyond the imagination of even the

great science fiction writers like Jules Verne and H. G. Wells. As far as the Government Electronics Division is concerned—this is only the beginning. Something new is learned every day.

**Ralph, W. Elsner**, Vice President and General Manager, Government Electronics Division



**(below) C/Star portable ground surveillance radar unit can identify and track moving vehicles and personnel up to 35 kilometers away.**







Motorola's financial condition remains strong. Total borrowings (short and long term) were 18.8 per cent of borrowings plus stockholder's equity. If marketable securities of \$61 million, largely the result of the accumulated profits of Puerto Rican subsidiaries, were offset against borrowings this debt to debt plus equity ratio would be 12.4 per cent.

Short-term borrowings are essentially all outside the U.S. and are primarily caused by exchange controls and the neutralizing of foreign exchange exposure risk. At yearend working capital was \$420 million and the current ratio was 2.2:1.

During 1976 we replaced a \$75 million revolving credit/term loan established in 1973 with a \$56 million revolving credit fully extending through March 1980 with \$7 million semi-annual reductions thereafter. Currently, the credit is being utilized as back-up for company-issued commercial paper. At yearend, approximately \$91 million of unused lines of credit were available to us.

Also in 1976, we paid the final installment of a \$15 million (later increased to \$22 million) long-term loan first extended to Motorola in 1951 by the Prudential Insurance Company of America, in which year Motorola's sales, earnings and net worth were \$135 million, \$7 million and \$32 million, respectively.

### Foreign Currency

During 1976 several sharp and many gradual changes took place in the market exchange ratios between the U.S. dollar and other world currencies. We are pleased to report that, despite this difficult environment, Motorola recorded a net gain of \$840,000 on foreign currency exchange and translation. This fine record results from both careful attention to asset and liability relationships in each of the non-U.S. operations and a conservative policy of attempting to stay near neutral in long vs. short exposure in each currency.

### Replacement Cost

Footnote No. 11 to the financial statements contains our compliance with the Securities and Exchange Commission's requirement for information on cost of sales and depreciation expense based on estimated replacement costs of inventories and fixed assets. Additional information will appear in our annual report to the SEC on Form 10-K, a copy of which is available to any stockholder upon request.

As we have discussed in earlier annual reports, our studies continue to confirm that, except in times of very severe (double digit) inflation, Motorola's inventory values generally follow a level or declining trend.

Fixed assets present a somewhat different story. The replacement cost of our buildings and equipment would be substantially higher than historical acquisition cost. However, because we use the declining balance method in our statements, the depreciation charge based on replacement cost and with a straight line method, would only be slightly higher and, in our studied opinion, the modestly higher depreciation would be more than offset by greater productivity of replacement equipment—if we were to replace the assets.

For these reasons and the other factors mentioned in the financial statement notes, we believe that the replacement cost data has limited significance.

**John T. Hickey,**  
Senior Vice President and  
Chief Financial Officer



**Donald R. Jones,**  
Vice President and  
Assistant Chief  
Financial Officer



# Consolidated Balance Sheets

(Dollars in thousands)

Motorola, Inc. and Subsidiaries as of December 31	1976	1975
<b>ASSETS</b>		
<b>CURRENT ASSETS</b>		
Cash .....	\$ 21,952	\$ 26,230
Short-term investments, at cost (approximating market) .....	60,839	37,544
Accounts receivable, less provision for doubtful accounts (1976, \$10,426; 1975, \$8,380) .....	304,676	252,098
Inventories, at the lower of average cost or market		
Finished goods .....	93,859	85,122
Work in process and production materials .....	224,226	196,974
Future income tax benefits .....	24,145	16,732
Other current assets .....	30,621	28,302
<b>TOTAL CURRENT ASSETS</b>	<b>760,318</b>	<b>643,002</b>
<b>PLANT AND EQUIPMENT, AT COST</b>		
Land .....	19,262	17,925
Buildings .....	243,879	232,492
Machinery and equipment .....	338,151	288,483
Accumulated depreciation .....	(227,672)	(198,056)
<b>NET PLANT AND EQUIPMENT</b>	<b>373,620</b>	<b>340,844</b>
<b>SUNDRY ASSETS, NET</b>	<b>22,871</b>	<b>17,614</b>
<b>TOTAL ASSETS</b>	<b>\$1,156,809</b>	<b>\$1,001,460</b>
<b>LIABILITIES AND STOCKHOLDERS' EQUITY</b>		
<b>CURRENT LIABILITIES</b>		
Notes payable-banks and other .....	\$ 62,708	\$ 53,024
Current maturities of long-term debt .....	1,543	1,324
Accounts payable .....	115,770	91,020
Accrued expenses .....	113,757	88,444
Income taxes .....	46,772	13,697
<b>TOTAL CURRENT LIABILITIES</b>	<b>340,550</b>	<b>247,509</b>
<b>LONG-TERM DEBT</b>	<b>94,007</b>	<b>119,184</b>
<b>OTHER NON-CURRENT LIABILITIES</b>	<b>36,495</b>	<b>23,776</b>
<b>STOCKHOLDERS' EQUITY</b>		
Common stock, \$3.00 par value		
Authorized: 40,000,000 shares		
Outstanding: 1976-28,540,416 shares; 1975-28,295,460 shares .....	85,621	84,886
Preferred stock, \$100 par value issuable in series		
Authorized: 500,000 shares (none issued) .....	—	—
Additional paid-in capital .....	149,027	139,504
Retained earnings .....	451,109	386,601
<b>TOTAL STOCKHOLDERS' EQUITY</b>	<b>685,757</b>	<b>610,991</b>
<b>TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY</b>	<b>\$1,156,809</b>	<b>\$1,001,460</b>

See accompanying notes to consolidated financial statements.



## Statements of Consolidated Earnings and Retained Earnings

(Dollars in thousands, except per share data)

Motorola, Inc. and Subsidiaries, Years Ended December 31	1976	1975
SALES AND OTHER REVENUES .....	\$1,504,431	\$1,311,771
Manufacturing and other costs of sales .....	928,201	850,370
Selling, service and administrative expense .....	345,522	311,998
Depreciation of plant and equipment .....	54,631	50,546
Interest and amortization of debenture discount, expense and premium, net ...	16,388	20,387
Total costs and other expenses .....	1,344,742	1,233,301
Earnings from continuing operations before income taxes .....	159,689	78,470
Income taxes .....	71,822	37,343
EARNINGS FROM CONTINUING OPERATIONS .....	87,867	41,127
Loss from discontinued operations .....	(2,470)	—
Net earnings .....	85,397	41,127
Retained earnings at beginning of year .....	386,601	365,248
Cash dividends declared (per common share: 1976, \$.735; 1975, \$.70) .....	(20,889)	(19,774)
Retained earnings at end of year .....	\$ 451,109	\$ 386,601
EARNINGS PER SHARE FROM CONTINUING OPERATIONS .....	\$ 3.10	\$ 1.46
Net earnings per share .....	3.01	1.46

## Statements of Consolidated Additional Paid-in Capital

(Dollars in thousands)

Motorola, Inc. and Subsidiaries, Years Ended December 31	1976	1975
Balance at beginning of year .....	\$ 139,504	\$ 135,898
Share option plans .....	7,777	1,032
Conversion of 4½% convertible guaranteed debentures (principal amount: 1976, \$2,245; 1975, \$3,226) .....	1,746	2,444
Equity change in affiliate .....	—	130
Balance at end of year .....	\$ 149,027	\$ 139,504

See accompanying notes to consolidated financial statements.



# Statements of Consolidated Changes in Financial Position

(Dollars in thousands)

Motorola, Inc. and Subsidiaries, Years Ended December 31	1976	1975
<b>SOURCES OF FUNDS:</b>		
Net earnings from continuing operations	\$ 87,867	\$ 41,127
Add non-cash charges:		
Depreciation	54,631	50,546
Amortization of deferred debenture discount, expense and premium, net	225	285
Funds provided from continuing operations	142,723	91,958
Net loss from discontinued operations	(2,470)	—
Add non-cash charge—depreciation	985	—
Funds used by discontinued operations	(1,485)	—
Funds provided from operations	141,238	91,958
Increase in notes payable and current maturities of long-term debt	9,903	—
Decrease in receivables	—	17,747
Decrease in inventories	—	54,659
Disposals and other changes of plant and equipment (and tooling), net	9,938	7,709
Issuance of common stock	10,258	3,927
Increase in income taxes	33,075	—
Other sources, net	47,568	—
Total sources of funds	251,980	176,000
<b>USES OF FUNDS:</b>		
Decrease in notes payable and current maturities of long-term debt	—	35,843
Increase in receivables	52,578	—
Increase in inventories	35,989	—
Fixed asset expenditures (includes subsidiaries acquired in 1975, \$1,153)	96,073	71,253
Increase in equipment rented to others, at cost	2,257	2,918
Decrease in long-term debt	25,177	28,626
Dividends	20,889	19,774
Decrease in income taxes	—	1,471
Other uses, net	—	4,795
Total uses of funds	232,963	164,680
NET INCREASE IN FUNDS	19,017	11,320
Cash and short-term investments		
Beginning of year	63,774	52,454
End of year	\$ 82,791	\$ 63,774

See accompanying notes to consolidated financial statements.

## Accountants' Report

PEAT, MARWICK, MITCHELL & CO. Certified Public Accountants 222 South Riverside Plaza, Chicago, Illinois 60606

The Board of Directors and Stockholders of Motorola, Inc.:

We have examined the consolidated balance sheets of Motorola, Inc. and Subsidiaries as of December 31, 1976 and 1975, and the related statements of consolidated earnings and retained earnings, additional paid-in capital and changes in financial position for the years

then ended. Our examinations were made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned consolidated financial

statements present fairly the financial position of Motorola, Inc. and Subsidiaries at December 31, 1976 and 1975, and the results of their operations and changes in their financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

PEAT, MARWICK, MITCHELL & CO.  
February 10, 1977



# Notes to Consolidated Financial Statements

**1. ACCOUNTING POLICIES:** Following is a summary of significant accounting policies used in the preparation of these consolidated financial statements, which policies are in accordance with generally accepted accounting principles.

**CONSOLIDATION:** The consolidated financial statements include the accounts of the company and all majority-owned subsidiaries. All significant intercompany accounts and transactions have been eliminated in consolidation.

**INTERNATIONAL:** The company generally follows the method (adopted in 1976) of foreign currency translation recommended in Statement No. 8 of the Financial Accounting Standards Board. Assets and liabilities expressed in foreign currencies, other than principally fixed assets and inventories, are translated at the approximate yearend rates of exchange; inventories and fixed assets are translated at approximate rates in effect when the assets were acquired. The earnings statements are translated at rates prevailing during the year except for depreciation, amortization and cost of sales, which are translated at historical rates. Gains and losses from currency realignments have been reflected in earnings as incurred.

The effect of this change in method on years prior to 1976 is not material and, accordingly, prior years' financial statements have not been restated.

**INVENTORIES:** Inventories are valued at the lower of average cost (which approximates computation on a first-in, first-out basis) or market. Market value of work in process and production materials is represented by replacement cost and for finished goods by net realizable value.

**INCOME TAX:** The company provides for income taxes based on income reported for financial statement purposes. Certain charges to earnings differ as to timing from those deducted for tax purposes. The tax effects of these differences are reflected in the consolidated balance sheets primarily as Future Income Tax Benefits. Investment tax credits are recorded as a reduction of income tax expense in the year that the related assets are placed in service.

**PLANT AND EQUIPMENT:** Plant and equipment is stated at cost. The related cost and accumulated depreciation on property sold, retired or fully depreciated are cleared from the accounts with the net difference, less any amount realized from disposals, reflected in current operations. Depreciation is provided on the basis of the estimated useful lives generally by the declining balance method. For income tax purposes, the company has selected the provisions of the Class Life Asset Depreciation Range System (ADR) permitting accelerated depreciation. The tax effect of the difference between book and tax depreciation has been provided as deferred income taxes in the accompanying consolidated financial statements.

**DEBENTURE DISCOUNT, EXPENSE AND PREMIUM:** Deferred debenture discount, expense and premium are included in Sundry Assets at unamortized cost. Amortization is being charged to expense over the terms of the debentures, generally by the straight-line method.

**SHARE OPTIONS:** When share options are exercised, the proceeds received are credited to the common stock account to the extent of the par value of shares issued, and the excess is credited to Additional Paid-In Capital. The tax benefit the company receives from disqualifying dispositions by optionees of exercised qualified share options is credited to Additional Paid-In Capital.

**PRODUCT AND SERVICE WARRANTIES:** Anticipated costs related to product and service warranties are recorded at the time of the sale of the products.

**EARNINGS PER SHARE:** Earnings per share are calculated on the average daily shares outstanding.

**2. INTERNATIONAL OPERATIONS:** Net foreign currency exchange gains of \$840,000 and \$1,232,000 are included in net earnings for 1976 and 1975, respectively.

The company's equity in undistributed earnings of non-U.S. subsidiaries and affiliates included in consolidated retained earnings at December 31, 1976, amounted to \$42,515,000 (\$39,600,000 in 1975). Certain of these earnings may be taxable in the United States upon distribution; however, it is intended that these earnings be permanently invested in operations outside the United States and accordingly, no provision has been made for United States taxes.

At December 31, 1976 and 1975, net assets of consolidated operations outside the United States aggregated \$137,893,000 and \$131,200,000, respectively.

Export sales of U.S. companies, and sales and other revenues of continuing operations outside the United States, were 29% of both the 1976 and 1975 consolidated amounts.

**3. LONG-TERM DEBT:** Long-term debt at December 31 consisted of the following:

	1976	1975
	(Dollars in thousands)	
Debt outside the United States:		
4½% convertible guaranteed debentures		
due July 1, 1983 .....	\$ 7,016	\$ 9,261
8% guaranteed sinking fund debentures		
due March 1, 1987 (net of debentures		
held by the company for sinking		
fund payments, \$1,090,000 in 1976;		
none in 1975) .....	23,910	25,000
Notes payable (generally at prevailing prime		
rates) due in installments to 1985 .....	13,018	9,788
Debt in the United States:		
Commercial paper supported by revolving		
credit commitments from banks .....	30,215	52,890
4¾% debentures due April 1, 1986 (net of		
debentures held by the company for		
sinking fund payments \$1,609,000 in		
1976; \$931,000 in 1975) .....	21,391	23,069
4¾% note due in annual installments		
to 1976 .....	—	500
	95,550	120,508
Less current maturities, included in		
current liabilities .....	1,543	1,324
Net long-term debt .....	\$94,007	\$119,184



The 4½% convertible guaranteed debentures (issued by Motorola International Development Corporation) are convertible into common stock of Motorola, Inc., at the rate of 25.2 shares for each \$1,000 principal amount, subject to adjustment in certain events, and are guaranteed as to the payment of principal and interest by Motorola, Inc. The debentures are redeemable at various dates at redemption prices reducing from 102% to 100% of the principal amount thereof. In 1976, \$2,245,000 in debentures (\$3,226,000 in 1975) were converted into 56,554 shares (81,285 in 1975). At December 31, 1976, there were 176,890 shares (233,444 shares in 1975) of Motorola, Inc. common stock reserved for issuance upon the conversion of these debentures.

The 8% guaranteed sinking fund debentures (issued by Motorola International Capital Corporation) are redeemable at various dates beginning March 1, 1977, at redemption prices reducing from 102% to 100% of the principal amount thereof. Annual sinking fund payments are required beginning March 1, 1977 in progressive amounts sufficient to retire 76% of the issue prior to maturity. The issue is guaranteed as to payment of principal and interest by Motorola, Inc.

The full amount of the revolving credit agreement (\$56,000,000) extends through March 31, 1980, with \$7,000,000 in equal semi-annual reductions thereafter. Under the terms of the agreement, any borrowings through September 30, 1979, will be at the prevailing prime commercial rate of interest, for the next two years at the prevailing prime commercial rate of interest plus ¼%, and for the last two years at the prevailing prime commercial rate of interest plus ½%. It is the intention of the company to maintain the availability of the revolving credit during 1977, and therefore, the debt is classified as long-term debt.

The revolving credit agreement restricts retained earnings available for payment of cash dividends. At December 31, 1976, approximately \$157,000,000 of retained earnings was not restricted as to dividend payments. The revolving credit agreement also requires the company to maintain a ratio of consolidated current assets to consolidated current liabilities at not less than 1.75:1 and consolidated net working capital (as defined) of not less than \$225,000,000.

**4. INCOME TAXES:** Income taxes provided for the years ended December 31, 1976 and 1975 are as follows:

	1976	1975
	(Dollars in thousands)	
Current:		
United States .....	\$56,511	\$23,704
Other Nations .....	7,817	6,503
State income taxes (U.S.) .....	6,323	3,393
<b>Total current .....</b>	<b>70,651</b>	<b>33,600</b>
Deferred .....	1,171	3,743
<b>Total income taxes .....</b>	<b>\$71,822</b>	<b>\$37,343</b>

Total income taxes differ from the statutory U.S. Federal income tax rate of 48%. The principal reasons for this difference are reflected below:

	1976	1975
Statutory U.S. Federal rate .....	48.0%	48.0%
Increase/(decrease) in tax rate resulting from:		
Taxes on earnings in other nations, net of loss operations with no tax benefits and tax holidays .....	1.4	10.5
Tax benefits arising from tax holiday in:		
Puerto Rico .....	(5.0)	(7.8)
Investment credits .....	(3.0)	(3.4)
State income taxes .....	2.1	2.2
Tax benefits derived from consolidation of certain Western Hemisphere Trade Corporations .....	.4	(1.9)
Other .....	1.1	—
<b>Effective tax rate .....</b>	<b>45.0%</b>	<b>47.6%</b>

Income taxes have been provided in the accounts based upon income recorded therein. Certain timing differences exist which cause the current income taxes actually payable to differ from the amount provided. The principal items are as follows:

	1976	1975
	(Dollars in thousands)	
Difference between depreciation recorded for income tax purposes and financial statement purposes .....	\$2,229	\$1,440
(Increase)/decrease in:		
Future warranty obligations .....	12	(207)
Future vacation obligations .....	(417)	(155)
Inventory adjustment accruals .....	(89)	861
Incentive bonus plan .....	(1,701)	406
IRS audit timing reversals .....	—	660
Other—net .....	1,137	738
<b>Total .....</b>	<b>\$1,171</b>	<b>\$3,743</b>

The company's Federal Income Tax Returns have been examined by the Internal Revenue Service through December 31, 1973.

At December 31, 1976, certain foreign subsidiaries of the company had tax loss carry forwards of approximately \$15,000,000.

**5. SHARE OPTION PLAN:** Under the company's Employee Share Option Plans, shares of common stock have been made available for qualified or non-qualified option to employees of the company and certain subsidiaries. Options may be granted at not less than fair market value on the dates of grants, and become exercisable one year from the date of original grants. Qualified options expire at the end of five years and non-qualified options expire at the end of ten years.



Data on share options are summarized below:

	1976	1975
Options outstanding beginning of year	1,030,493	791,703
Additional options granted	320,910	307,335
Options exercised	(188,402)	(25,990)
Options terminated for discontinued employment	(47,530)	(42,555)
Options expired	(5,796)	—
Options outstanding end of year	1,109,675	1,030,493
Shares reserved for possible future option grants	32,411	299,995
Total shares reserved	1,142,086	1,330,488
Aggregate exercise price of outstanding options	\$53,423,000	\$49,027,000
Aggregate exercise price of exercisable options	\$38,517,000	\$33,177,000

Options exercised during 1976 were at per share prices of \$42.25 to \$52.56 (\$31.95 to \$46.25 in 1975). Options outstanding at December 31, 1976, were at per share prices of \$42.25 to \$63.75.

**6. CONTINGENCIES:** The company is one of 21 defendants named in a lawsuit commenced on September 20, 1974, by Zenith Radio Corporation ("Zenith") in the United States District Court for the Eastern District of Pennsylvania. All other defendants are either Japanese television manufacturers or United States subsidiaries of such Japanese corporations. Zenith's complaint alleges conspiracies and other violations of the U.S. antitrust and antidumping laws.

The complaint also challenges, under the U.S. antitrust laws, the purchase by subsidiaries of Matsushita Electric Industrial Co., Ltd. of Japan (collectively with such subsidiaries, "MEI") of certain of the assets and business of Motorola's Consumer Products Division home television receiver business. (See note 7 relating to discontinued operations.) Prior to the consummation of such purchase, the U.S. Department of Justice, at the request of Motorola and MEI, investigated the antitrust implications of the transaction. During such investigations, the Department of Justice was advised by Zenith of Zenith's objections to the sale. The Department of Justice took no legal action to prevent the sale.

For all such alleged violations Zenith claims monetary damages in the aggregate of more than \$300 million (and the trebling of that amount). It seeks judgment against the defendants jointly and individually in that amount plus costs and plaintiff's attorney's fees. It also seeks divestiture by MEI of the assets purchased from Motorola.

In the event a divestiture is ordered or litigation damages are assessed against MEI arising out of such purchase, Motorola has agreed to share to a limited extent certain of the dollar loss, if any, incurred by MEI. The maximum loss for which Motorola could be responsible to MEI under this agreement is \$20 million. Management believes that the company has acted properly throughout and has denied any conspiracy or other violation of law alleged by Zenith.

The company is a defendant in various other suits and claims which arise in the normal course of business and is obligated under repurchase and other agreements principally in connection with the financing of sales.

In the opinion of management, the ultimate disposition of these matters will not have a material adverse effect on the business or financial position of the company.

**7. DISCONTINUED OPERATIONS:** On May 28, 1974, Motorola sold to certain subsidiaries of Matsushita Electric Industrial Co., Ltd., a Japanese corporation, certain of the assets of Motorola's Consumer Products Division home television receiver business. Because of disagreements between the parties, the sales price of the business could not be finally determined until such disagreements (including those applicable to Product and Service Warranty obligations, which were the subject of an arbitration proceeding) were resolved. All such disagreements were finally resolved in January of 1977, and the loss from discontinued operations has been reflected as a non-recurring net loss in the company's 1976 operations.

The loss from discontinued operations (including the net proceeds from disposition of certain assets not sold to Matsushita) is comprised as follows:

	(Dollars in thousands)		
	Pre-Tax	Income Taxes	Net
Operating losses incurred during the period subsequent to March 12, 1974	\$(11,878)	\$ (5,587)	\$ (6,291)
Gain on disposal	1,505	(2,316)	3,821
Loss from discontinued operations	\$(10,373)	\$ (7,903)	\$ (2,470)

The net gain after tax on the sale and disposition of the assets has been reduced by an estimate of remaining costs applicable to litigation against Motorola brought by Zenith Radio Corporation, which litigation was instituted as a result of the sale to Matsushita.

Income taxes applicable to the gain on disposal vary from the normal Corporate Federal income tax rate of 48%, principally because certain assets sold at a gain receive capital gains treatment for income tax purposes, whereas other assets sold at a loss result in a tax benefit at the 48% rate.

**8. EMPLOYEE BENEFIT PLANS:** An Executive Incentive Plan specifies that the company and certain subsidiaries may provide up to 4% of their annual consolidated pre-tax earnings, as defined, for the payment of cash incentive awards. Such awards are payable, except for awards of \$1,000 or less, generally in equal annual installments over a period of five years and are generally subject to the recipient's continued employment. Awards made in 1977 for 1976 performance are payable in full or may be deferred over five years at the option of the participant. Amounts of \$4,091,000 and \$1,408,000 were provided in 1976 and 1975 for such awards, representing 4% of defined earnings. In 1976 awards of \$2,202,000 were made for 1975 performance (\$2,083,000 in 1975 for 1974 performance). Awards for 1976 performance have not yet been determined. At December 31, 1976, \$4,953,000 was available for such awards (\$2,532,000 in 1975).

The company and certain subsidiaries have contributory profit sharing plans in which all eligible employees participate. The contributions to profit sharing funds in the United States



and other nations, based upon percentages of pre-tax earnings, as defined, were \$18,291,000 in 1976, and \$9,098,000 in 1975.

The company and certain subsidiaries have a voluntary, contributory pension plan and the company's policy is to fund pension costs as accrued: \$6,126,000 in 1976, and \$4,705,000 in 1975. At December 31, 1975, date of the latest actuarial determination, vested benefits were fully funded. Certain changes in actuarial assumptions increased the company's 1976 pension funding by approximately \$1,000,000. No significant increase in pension costs resulted from the Employee Retirement Income Security Act of 1975.

In the event that the amount actually payable annually under the plan does not amount to 40% or more of an officer's rate of salary at retirement, it is the intention of the company (subject to certain qualifications and conditions) to make supplementary payments so that the total annual payments will aggregate 40% (or 30% in the case of payments to widows) of the officer's rate of salary at retirement. The company also provides for annual payments in the amount of 30% of the officer's salary rate to widows of officers who die while in active employment. The company is providing for these supplementary payments on a current basis.

**9. SUPPLEMENTARY DATA:** Research and Development expenditures, which are charged against operations as incurred, were \$101,536,000 in 1976, and \$98,479,000 in 1975.

Rental expense of operations under all lease commitments (including non-cancellable leases) totaled \$21,055,000 in 1976, and \$20,273,000 in 1975. If all financing leases (which are principally for computers) were capitalized, the impact on net earnings would be insignificant. Commitments related to non-cancellable leases expire as follows:

1977	\$12,869,000	1982-1986	\$2,491,000
1978	8,786,000	1987-1991	562,000
1979	4,775,000	1992-1996	697,000
1980	2,753,000	1997 and later	4,648,000
1981	1,238,000		

**10. QUARTERLY FINANCIAL DATA (Unaudited):** Summarized quarterly financial data for 1976 and 1975, are as follows:

	THREE MONTHS ENDED			
	April 3	July 3	Oct. 2	Dec. 31
<b>1976:</b>				
Sales and other revenues .....	\$346,996	\$383,545	\$361,459	\$412,431
Gross profit before depreciation (a) .....	131,957	149,600	138,380	156,293
Earnings from continuing operations .....	16,898	22,174	22,935	25,860
Loss from discontinued operations (b) .....	—	—	—	(2,470)
Net earnings .....	\$ 16,898	\$ 22,174	\$ 22,935	\$ 23,390
Earnings per share from continuing operations ..	\$ .60	\$ .78	\$ .81	\$ .91
Net earnings per share ...	\$ .60	\$ .78	\$ .81	\$ .82

(Dollars in thousands, except per share data)

### THREE MONTHS ENDED

<b>1975:</b>	March 29	June 28	Sept. 27	Dec. 31
Sales and other revenues .....	\$303,881	\$344,844	\$307,040	\$356,006
Gross profit before depreciation (a) .....	105,675	121,846	102,545	131,335
Net earnings .....	\$ 7,630	\$ 11,730	\$ 9,627	\$ 12,140
Net earnings per share ...	\$ .27	\$ .42	\$ .34	\$ .43

(a) Profit after manufacturing and other costs of sales exclusive of depreciation expense.

(b) The effect of recognizing the final adjustments on the disposition of the home television receiver business (See footnote 7).

Peat, Marwick, Mitchell & Co. made a limited review of the 1976 quarterly data in accordance with standards established by the American Institute of Certified Public Accountants, but no such review was made of the 1975 quarterly data. Since Peat, Marwick, Mitchell & Co. did not audit the quarterly data for either year, they express no opinion on such data.

**11. ESTIMATED REPLACEMENT COST INFORMATION (Unaudited):** Requirements of the Securities and Exchange Commission direct the calculation of cost of sales and depreciation expense based on the estimated replacement costs of inventories and fixed assets.

The company has extensively studied revaluing inventory on a LIFO basis, and has concluded that no significant change would thereby result. These studies also indicate that stated costs of inventories and cost of sales also approximate a replacement cost basis. Consequently, the company's stated inventory value and cost of sales have not been restated. While the replacement cost of the company's fixed assets would be substantially higher than the stated acquisition cost, and while depreciation charges (straight-line) based on such higher replacement costs would be approximately \$5.6 million higher than the 1976 depreciation charge in the financial statements, management believes (but cannot definitively quantify) that lower costs of operation would result from using newer and more efficient fixed assets and that the savings, which would result from these efficiencies, would at least offset the higher depreciation indicated. Because the SEC's requirements exclude the effect of price level changes on assets and liabilities other than inventories and fixed assets, the data cannot be used to estimate the effect of inflation on the company's operation. Also, because of the inherent subjectivity of the replacement cost disclosure requirements and the consequent differences of interpretation between different companies, management believes that this information has limited significance.

The company's annual report to the SEC on Form 10-K, a copy of which is available upon request, will contain the prescribed SEC disclosure.



# Ten Year Financial Summary

(Dollars in thousands, except per share data)

<b>Operating Results From Continuing Operations (1)</b>	1976	1975
SALES AND OTHER REVENUES .....	\$1,504,431	\$1,311,771
Manufacturing and other costs of sales .....	928,201	850,370
Selling, service & administrative expense .....	345,522	311,998
Depreciation of plant and equipment .....	54,631	50,546
Interest & amortization of debenture discount, expense and premium, net .....	16,388	20,387
Total costs and other expenses .....	1,344,742	1,233,301
Earnings from continuing operations before income taxes .....	159,689	78,470
Income taxes .....	71,822	37,343
<b>EARNINGS FROM CONTINUING OPERATIONS .....</b>	<b>87,867</b>	<b>41,127</b>
<b>RETURN ON SALES .....</b>	<b>5.8%</b>	<b>3.1%</b>
Discontinued operations—profit/(loss) .....	(2,470)	—
Net earnings .....	\$ 85,397	\$ 41,127
<b>Operating Results as Originally Reported (1)</b>		
Sales and other revenues .....		
Net earnings .....		
Return on sales .....		
<b>Per Share Data</b>		
Earnings from continuing operations .....	\$3.10	\$1.46
Net earnings .....	3.01	1.46
Dividends declared .....	.735	.70
<b>Balance Sheet and Other Data (2)</b>		
Working capital .....	\$ 419,768	\$ 395,493
Current ratio .....	2.23:1	2.60:1
Short-term debt .....	\$ 64,251	\$ 54,348
Long-term debt .....	94,007	119,184
Stockholders' equity .....	685,757	610,991
Less: short-term investments .....	60,839	37,544
Total invested capital .....	\$ 783,176	\$ 746,979
Return on average invested capital .....	11.6%	5.3%
Return on average stockholders' equity .....	13.6%	6.9%
Yearend employment (approximate) .....	56,000	47,000
Average shares outstanding (in thousands) .....	28,380	28,243

(1) In March, 1974, Motorola sold its home television business. Due to the substantial size of this business, it was both desirable and necessary to reflect the historical operating results of Motorola's remaining business without the home television operations included. As a result, the 1967-1973 operating results Motorola reported to stockholders during this period of time were adjusted to remove the effect of the television business—these revised operating results are reported above as results from *Continuing Operations*. The financial statistics entitled *As Originally Reported*, are the exact results Motorola reported to stockholders at each applicable period of time.

(2) 1974-1976 data is from continuing operations; 1967-1973 data is as originally reported and has not been restated on a continuing operations basis.

## MANAGEMENT DISCUSSION AND ANALYSIS OF STATEMENTS OF CONSOLIDATED EARNINGS

Sales and other revenues from continuing operations increased 14.7% in 1976, while 1975 sales were down 4.1% from the previous year. As stated in other parts of this report, the sales improvement in 1976 was primarily in the Semiconductor Group (up 28%) and the Automotive Products Division (up

23% from the previous year). These operations both recovered from depressed sales of the previous year when sales were down 23% in the Semiconductor Group and down 12% in the Automotive Products Division, due principally to depressed economic conditions throughout the world.

Manufacturing and other costs of sales increased 9.2% in 1976 while such costs decreased 3.2% in 1975. The cost changes are generally consistent with the sales changes in each year except that 1976 costs also reflect improved productivity and strengthened cost controls throughout the company.

Selling, service and administration expense increased 10.7% in 1976 and 9.8% in 1975 over the previous year. The increase in 1976 is less than the sales increase of 14.7% and reflects improved cost controls throughout the company. The increased cost in 1975 on a sales decline of 4.1% did not fully reflect the efficiencies implemented in 1975 due to the timing of the cutbacks and associated severance pay. In addition, the company increased its ownership to over 50% in two



	1974	1973	1972	1971	1970	1969	1968	1967
	\$1,367,171	\$1,203,217	\$ 901,883	\$717,177	\$670,189	\$666,019	\$559,030	\$449,926
	878,675	755,720	607,695	469,583	451,821	437,439	376,972	301,826
	284,241	239,994	166,849	155,527	123,435	121,211	102,548	76,631
	43,456	33,340	28,376	25,028	21,745	18,514	15,612	13,237
	27,201	16,194	10,299	7,613	9,332	11,121	7,731	6,488
	1,233,573	1,045,248	813,219	657,751	606,333	588,285	502,863	398,182
	133,598	157,969	88,664	59,426	63,856	77,734	56,167	51,744
	60,686	72,496	41,103	29,878	33,339	42,108	28,954	23,851
	72,912	85,473	47,561	29,548	30,517	35,626	27,213	27,893
	5.3%	7.1%	5.3%	4.1%	4.6%	5.3%	4.9%	6.2%
	(2,184)	(3,477)	4,477	2,202	(6,277)	(1,833)	1,048	(9,077)
	\$ 70,728	\$ 81,996	\$ 52,038	\$ 31,750	\$ 24,240	\$ 33,793	\$ 28,261	\$ 18,816
.....		\$1,437,099	\$1,163,315	\$926,593	\$796,418	\$873,224	\$775,124	\$629,975
.....		81,996	52,038	31,750	24,240	33,793	28,261	18,816
.....		5.7%	4.5%	3.4%	3.0%	3.9%	3.6%	3.0%
	\$2.60	\$3.07	\$1.74	\$1.10	\$1.15	\$1.44	\$1.11	\$1.14
	2.52	2.95	1.91	1.18	.91	1.37	1.15	.77
	.60	.45	.312	.30	.288	.25	.25	.25
	\$ 412,335	\$ 427,715	\$ 323,544	\$256,150	\$222,117	\$235,593	\$176,414	\$131,358
	2.31:1	2.43:1	2.36:1	2.22:1	2.39:1	2.47:1	2.08:1	1.88:1
	\$ 90,191	\$ 66,377	\$ 53,875	\$ 47,075	\$ 33,503	\$ 7,749	\$ 36,615	\$ 53,164
	147,810	150,338	80,302	63,780	65,348	90,306	96,601	65,079
	585,711	523,481	439,611	375,897	344,085	326,134	238,778	206,286
	23,336	21,982	30,092	4,230	6,070	19,704	26,255	596
	\$ 800,376	\$ 718,214	\$ 543,696	\$482,522	\$436,866	\$404,485	\$345,739	\$323,933
	9.4%	13.0%	10.0%	7.0%	5.6%	8.8%	8.5%	5.9%
	13.0%	17.1%	12.9%	8.9%	7.2%	12.8%	12.9%	9.5%
	51,000	64,000	56,000	49,000	37,000	45,000	41,000	36,000
	28,085	27,823	27,297	26,822	26,650	24,656	24,534	24,488

International subsidiaries, as a result, the expenses of these subsidiaries were consolidated for the first time in 1975, and increased these costs by \$5.2 million over 1974.

Depreciation of plant and equipment increased 8.1% and 16.3% in 1976 and 1975, respectively, over the previous year. These increases are the result of fixed asset expenditures during the past three years of \$96.1 million in 1976, \$70.1 million in 1975 and \$131.2 million in 1974.

Interest and amortization expense declined 19.6% in 1976 and 25.1% in 1975 due to reductions in debt and to declining interest rates. The reductions in debt were attributable to the implementation of more stringent administrative controls, as well as efforts to achieve improved management over accounts receivable and inventories.

The company's overall effective tax rate decreased from 47.6% in 1975, to 45.0% in 1976 due primarily to earnings of International Operations that were in a loss position in 1975.

The net earnings from continuing operations increased 113.6% in 1976 and decreased 43.6% in 1975 due principally to

the Semiconductor Group and Automotive Products Division, which incurred losses in 1975 and returned to a profitable position in 1976.

Additional comments on the results of operations may be found in other sections of this Annual Report.

#### SALES BY SIMILAR CLASSES OF PRODUCTS

(Dollars in millions)	1976	1975	1974	1973	1972
Communication Products	\$705	\$621	\$586	\$469	\$365
Semiconductor Products	447	348	454	419	286
Automotive Products	156	126	144	144	101

The sales of Semiconductor Products do not include the dollar value of Semiconductor Products manufactured by Motorola and incorporated into other products manufactured and sold by Motorola. In addition, the sales of Autovox S.p.A., an Italian subsidiary, are excluded from the sales of Automotive Products reported above.



## Directors

ROBERT W. GALVIN  
 WILLIAM J. WEISZ  
 JOHN F. MITCHELL  
 JAMES W. BIRKENSTOCK  
 President, Intercal Inc.  
 JOHN T. HICKEY  
 STEPHEN L. LEVY  
 HOMER L. MARRS  
 ARTHUR C. NIELSEN, JR.  
 Chairman of the Board  
 A. C. Nielsen Company  
 ARTHUR L. REESE  
 Retired, formerly Executive  
 Vice President, Motorola Inc.  
 ELMER H. SCHULZ  
 Director, I.I.T. Research Institute  
 WALTER B. SCOTT  
 EDWIN P. VANDERWICKEN  
 Chairman, Finance and Audit  
 Committees, Motorola Inc.  
 ELMER H. WAVERING  
 Retired, formerly Vice Chairman  
 and Chief Operating Officer,  
 Motorola Inc.  
 B. KENNETH WEST  
 Senior Vice President,  
 Harris Trust and Savings Bank

Director Emeritus:  
 DANIEL E. NOBLE  
 Chairman,  
 Science Advisory Board,  
 Motorola Inc.

## Officers Motorola, Inc.

	Age	Years of Service
<b>CORPORATE</b>		
Robert W. Galvin	54	36
William J. Weisz	50	29
John F. Mitchell	49	24
<b>FINANCE</b>		
John T. Hickey	51	29
Donald R. Jones	47	26
Edward J. Harty	61	25
Vincent J. Rauner	49	7
Lewis D. Spencer	60	26
William P. Meehan	41	7
<b>STAFF</b>		
Stephen L. Levy	55	13
L. Curtis Foster	51	3
R. James Haring	52	25
C. Travis Marshall	51	6
Walter B. Scott	61	31
<b>HUMAN RELATIONS</b>		
Benjamin W. Borne	52	5
Robert N. Swift	53	25
<b>MULTINATIONAL</b>		
Levy Katzir	44	21
<b>DATA PRODUCTS AND NEW VENTURES GROUP</b>		
Homer L. Marrs	60	39
<b>AUTOMOTIVE PRODUCTS DIVISION</b>		
Carl E. Lindholm	48	10
John D. Mueller	42	1
<b>COMMUNICATIONS GROUP</b>		
Joseph F. Miller, Jr.	52	25
Jack Germain	50	27
Arthur P. Sundry	48	20
Ira W. Walker	53	21
Rhesa S. Farmer, Jr.	50	19
Claude G. Davis	49	5
John M. Duich	54	9
Martin Cooper	48	23
<b>GOVERNMENT ELECTRONICS DIVISION</b>		
Ralph W. Elsner	56	28
James R. Lincicome	51	26
<b>SEMICONDUCTOR GROUP</b>		
John R. Welty	54	19
Robert R. Heikes	51	7
Earl R. Gomersall	45	5
Gary L. Tooker	37	15
Alfred J. Stein	44	1



## Staff Activities/New Ventures, Other Businesses

Managing a large corporation with operating groups in several high technology areas of the electronics industry requires a staff with a variety of special talents. Coordinating the activities of these specialized groups is the job of the Senior Vice President and Chief Corporate Staff Officer Stephen L. Levy. Reporting to Levy, a 13-year Motorola and former general manager of the Semiconductor Division, are corporate engineering; marketing; government relations; public relations and advertising; corporate planning; manufacturing and facilities; computer services; systems and telecommunications.

Through the years Motorola has been alert to new business opportunities both from inside and outside the company. To direct this effort, the corporation has had operating at the staff level an office of acquisitions and new ventures. Heading this office is Senior Vice President Homer L. Marrs, a Motorola for nearly 40 years and former general manager of the Communications Division. Also reporting to him are two of the operations that have resulted from the program: Data Products and Motorola Teleprograms, Inc.



**Stephen L. Levy**  
Senior Vice President  
and Chief Corporate  
Staff Officer



**Homer L. Marrs**  
Senior Vice President

## Motorola Products

### AUTOMOTIVE PRODUCTS DIVISION

- Car radios
- Stereo tape players
- Alternator charging systems
- Solid-state ignition systems
- Electronic instrumentation
- Electronic engine controls
- Citizens band radios and antennas

### COMMUNICATIONS GROUP

- Mobile and portable FM two-way radio communications systems
- Radio paging systems
- Communications control centers
- Signaling and remote control systems
- Car telephone systems
- Microwave communications systems
- Health care communications systems
- Precision instruments
- Component products
- Electronic command and control systems
- Mobile data communications systems

### GOVERNMENT ELECTRONICS DIVISION

- Fixed and satellite communications systems
- Space communications systems
- Tactical electronics systems
- Radar surveillance and display systems
- Positioning and navigation systems
- Countermeasures systems
- Missile guidance systems
- Drone control systems
- Data security modules
- Missile and aircraft instrumentation
- Secure communications

### SEMICONDUCTOR GROUP

- MOS and bipolar integrated circuits
- Microprocessors
- Micro-components and systems
- Semiconductor chips
- Zener and tuning diodes
- RF modules
- Power and small signal transistors
- Field effect transistors (FETs)
- Microwave devices
- Optoelectronics
- Rectifiers
- Thyristors
- Varactors
- Triggers
- Suppressors
- Solar energy components

### OTHER BUSINESSES

- Educational films and materials
- CRT display modules
- Closed circuit TV systems
- Microprocessor test equipment
- Information display systems
- Industrial process controls
- Ferrite and iron core components

## Motorola Worldwide

### Major facilities in:


- Australia**  
Melbourne
- Canada**  
Midland and Willowdale, Ontario
- Denmark**  
Frederikssund
- France**  
Angers  
Toulouse
- West Germany**  
Taurusstein
- Great Britain**  
East Kilbride, Scotland  
Stofford and Warrington, England
- Hong Kong**  
Kowloon
- Israel**  
Tel-Aviv
- Italy**  
Rome
- Korea**  
Seoul
- Malaysia**  
Kuala Lumpur  
Penang
- Mexico**  
Guadalajara, Jalisco  
Mexico City, D.F.  
Nogales, Sonora
- Puerto Rico**  
Vega Baja
- South Africa**  
Bramley, Transvaal
- Switzerland**  
Geneva
- United States**  
Illinois  
Carol Stream  
Chicago  
Franklin Park  
Lombard  
Northlake  
Schaumburg  
Arizona  
Mesa  
Phoenix  
Scottsdale  
Tempe  
Florida  
Fort Lauderdale  
New York  
Arcade  
Texas  
Austin  
Fort Worth  
Seguin  
Missouri  
Webb City  
Iowa  
Mount Pleasant  
Pennsylvania  
Carlisle
- Motorola Executive Institute in:**  
Oracle, Arizona





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